OLYMPIA

Service manual

Carina II

Service Department

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1. FEATURES AND SPECIFICATIONS

Features and specifications of our Manual Portable Typewriters.

COMMON FEATURES AND SPECIFICATIONS

Typing System:	Impact Typing, Segment Shifting
Number of keys:	44 (88 Characters & Symbols)
Type Styles:	Pica ------- 10 Characters/Inch 0.1" (2.54 mm) Elite ------- 12 Characters/Inch 0.083" (2.12 mm)
Paper Sizes:	**Short Carriage Model** ---------- 9.88" (251.0 mm) **Original Carriage Model** -------- 12.5" (317.5 mm) **Wide Carriage Model** ---------- 13.7" (347.9 mm)
Typing Line Length:	**Short Carriage Model** ---------- 9.0" (232.0 mm) 91 Characters, Pica 109 Characters, Elite **Original Carriage Model** -------- 11.7" (297.2 mm) 117 Characters, Pica 140 Characters, Elite **Wide Carriage Model** ---------- 12.9" (327.8 mm) 129 Characters, Pica 154 Characters, Elite
Number of Copies:	Original and 4 copies
Ribbon:	Two-colors Ribbon (Black/Red) or Black only 10 Million Strokes
Features:	Touch Controller (Heavy or Light) Fully Programmable Tabulator (+ (Set) or - (Clear)) Automatic Space Repetition Line Spacing R ------- Neutralization 1 -------- 1/6" (4.23 mm) -(1-1/2) -1/4" (6.35 mm) 2 -------- 1/3" (8.46 mm)
Dimensions:	Width --- **Short Carriage Model** --------13.0" (330.0 mm) **Original Carriage Model** ---- 15.46" (392.5 mm) **Wide Carriage Model** -------- 16.46" (418.0 mm) Height ---------- 5.0" (127.0 mm) Depth ---------- 13.6" (345.0 mm)
Weight:	5.0 Kg ~ (11.05 lbs. ~)

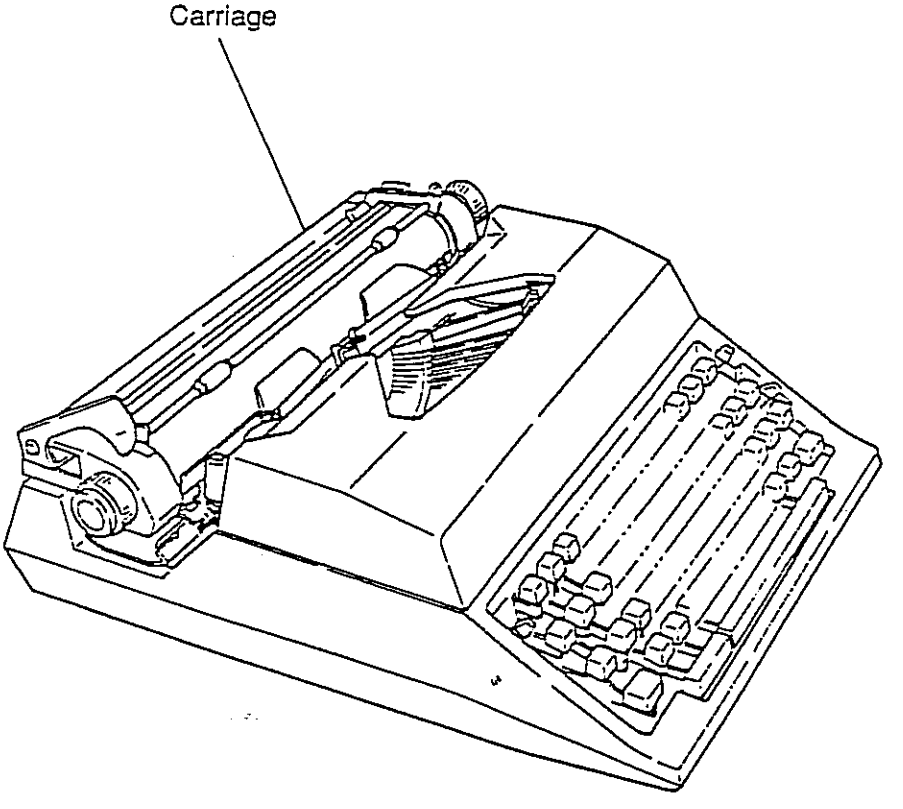
Schreibbreite 297 mm
Papierdurchlass 315 mm

Environmental Conditions for:

Operation --
Temperature 41° F to 95° F (5°C to 35° C)
Relative Humidity 5% to 85% (Without Condensation)

Storage --
Temperature -4° F to 140° F (–20°C to 60° C)
Relative Humidity 5 % to 85% (Without Condensation)

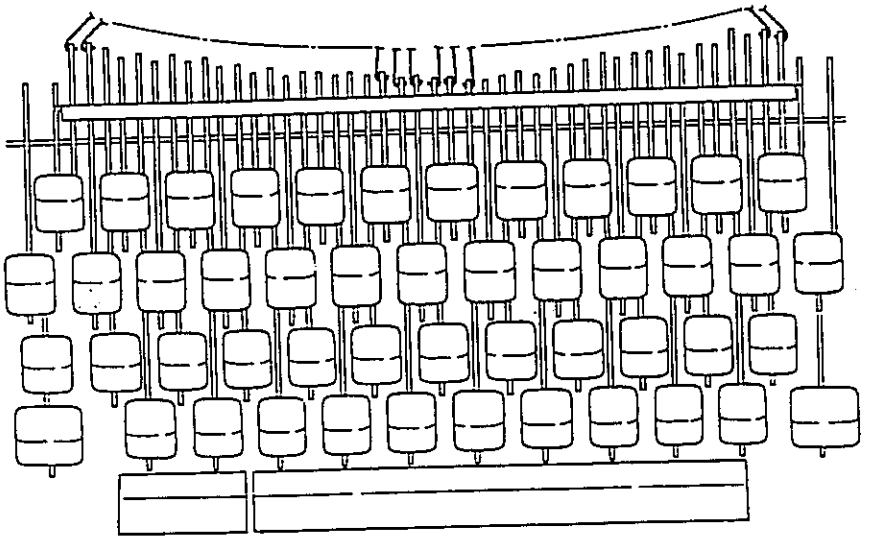
Note:
The nominal specifications represent the design specifications. All the units shall match them, some typewriter's specifications may be slightly different from the mentioned ratings. The limit specifications represent the worst conditions that can be considered acceptable. In all cases, the units comply with the specifications.



2. CONSTRUCTION AND GENERAL DESCRIPTION

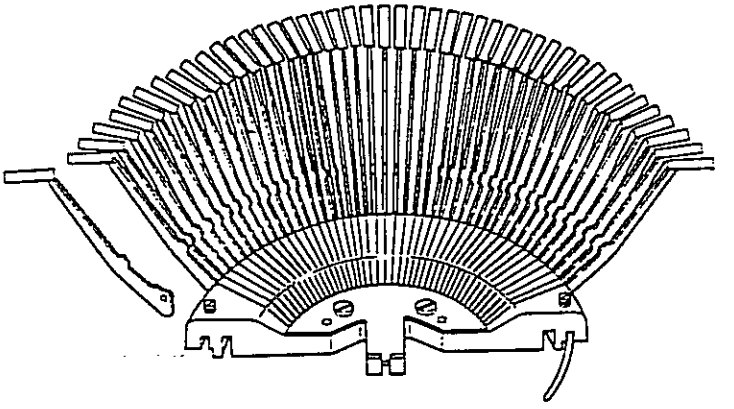
Keyboard Assembly

The Keyboard consists of 44 Keys including Characters, Symbols, Back Space, Margin Release, Tabulator, Shift Lock, two Shifts, Automatic Space Repetition Key and a Space Bar. These components are installed in the main unit front.



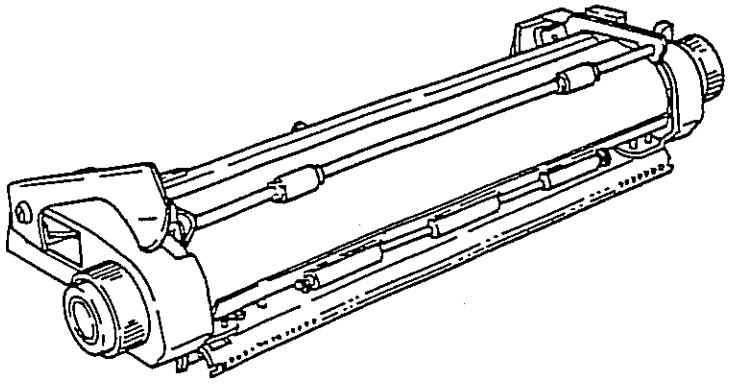
Segment, Type Bar and Typeface Assemblies

The 44 Type Bars on top of which the Type Font is soldered, are installed on the Segment, and the Fulcrum Shaft crossing the segment operates them. These elements are installed in the central portion of the main unit.
The Segment Universal Mechanism that activates the Escapement, is also installed in this Segment.

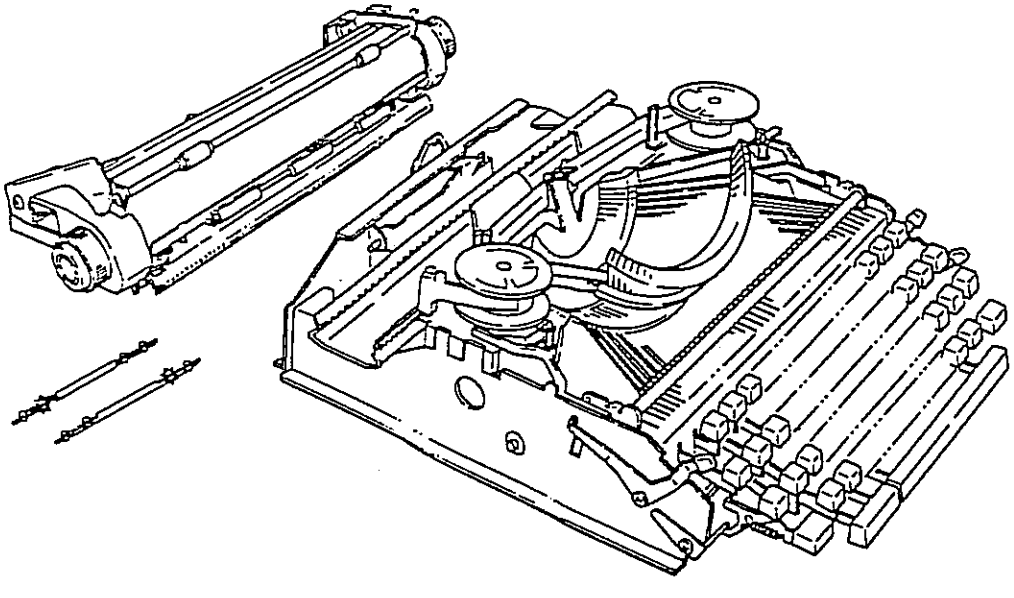


Carriage Assembly

The Carriage Assembly contains the Platen, Paper Pan, Return Handle, Paper Support, two Platen Knobs, a Variable Line Spacer and other devices.
These elements are installed in the rear part of the main unit, being operated by the segment.

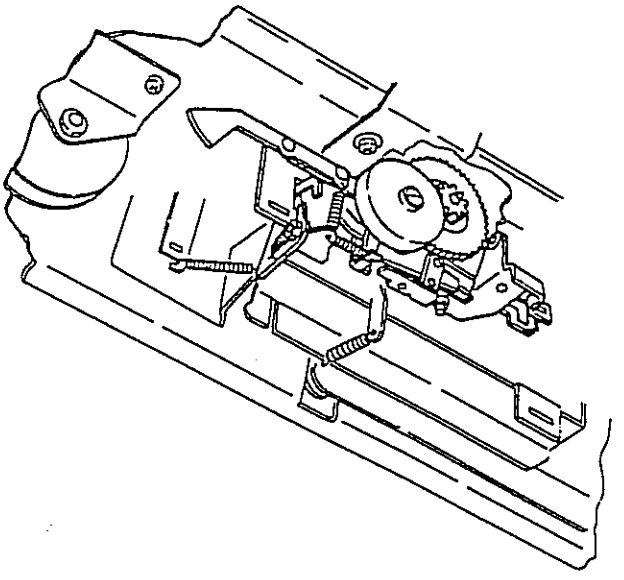


The Tension Band and the Eccentric Spring that slide the carriage are encased into the Drum.



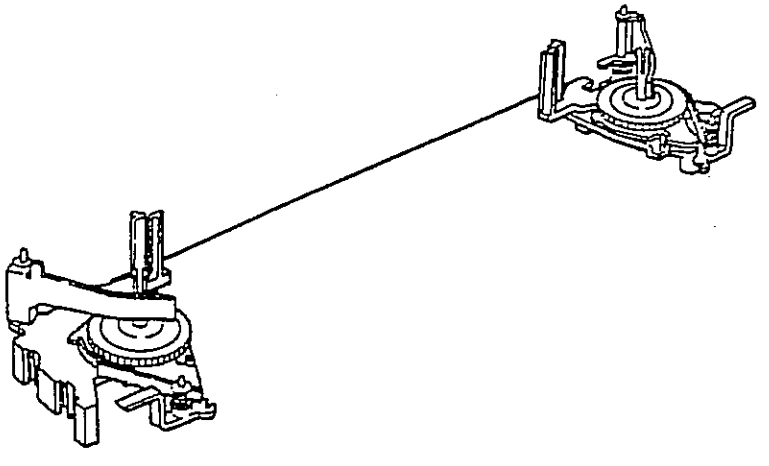
Escapement Assembly

This mechanism transmits the movement of the Typing Lever, Space Bar, etc. directly to the Carriage, and it is located just under the Carriage Base.



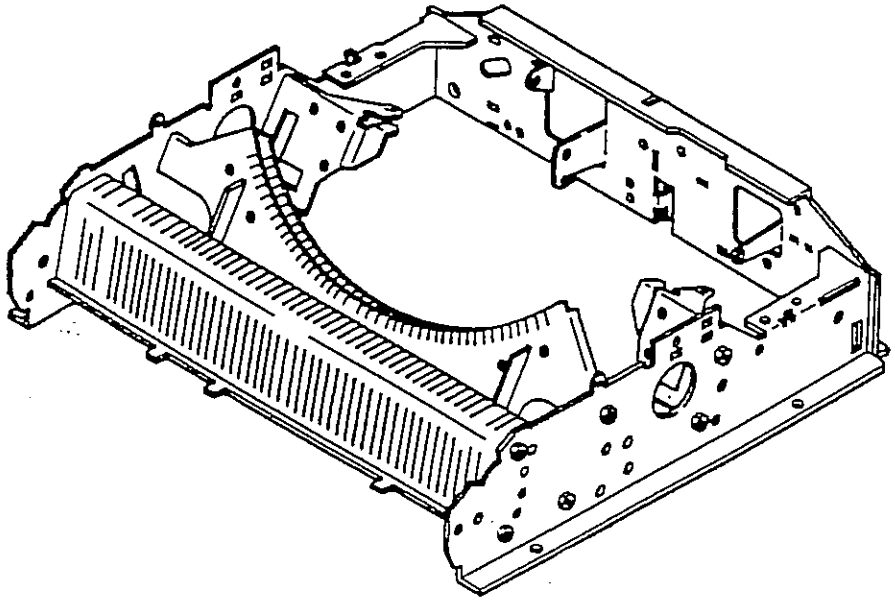
Ribbon Feeder Assembly

The Ribbon Feeder mechanism directly transmits the movement of the Ribbon Universal. The wire connecting the right and left Ribbon Feeder Units, act as a link controlling the direction of the ribbon movement.



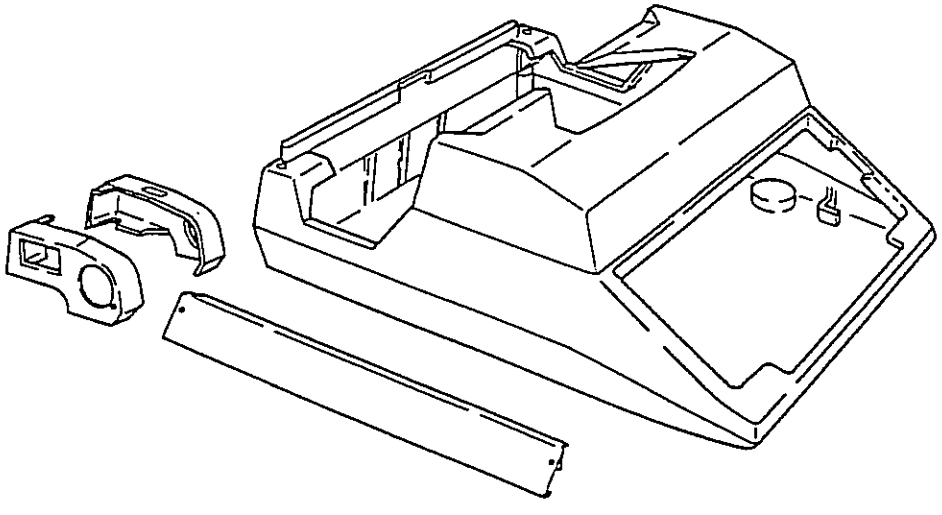
Chassis Assembly

The Chassis Assembly consists of the following six parts: Key Lever Holder, Left/Right Side Frames, Left/Right Slide Base and Back Frame, which are assembled by means of eighteen (18) Nuts. These Nuts shall never be removed or unscrewed.



Housing Assembly

The Top Cover, Main Cover, Bottom Pan, Side Covers (left/right), and the Carriage Back Cover are made of ABS-resin (excepting the Carriage Back Cover), and they protect the internal mechanism.

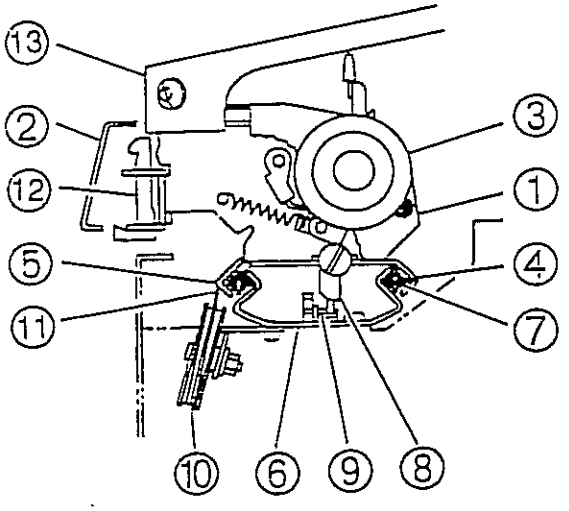


3. OPERATION OF EACH MECHANISM

3.1 Carriage

1) Carriage Left Side Cover
2) Carriage Back Cover
3) Left Side Platen Knob
4) Front Side Carriage Upper Rail
5) Rear Side Carriage Upper Rail
6) Carriage Base
7) Ball Bearing Complete
8) Carriage Rack
9) Escapement Pinion Gear
10) Main Spring
11) Draw Band
12) Tab Chip
13) Return Handle

LEFT SIDE VIEW



3.2 Line Spacer

a) **Line Spacer Operation**

When you operate the Return Handle (1), the Line Space Link (3) rotates the Line Space Feeding Arm (2), then the Line Space Feeder Pawl (4-a) slides along the Line Space Selector (5) Cam (5-a). The Feeder Pawl (4-a) engages with a tooth of the Line Spacer Ratchet (6), resulting in the Platen's line spacing.

The line spacing is limited by the pressure of the Line Space Feeder Pawl (4) holding the stopper Pin (7). Then the Spring (8) brings back the Return Handle (1) to its home position.

b) **Detent Arm and Detent Heel**

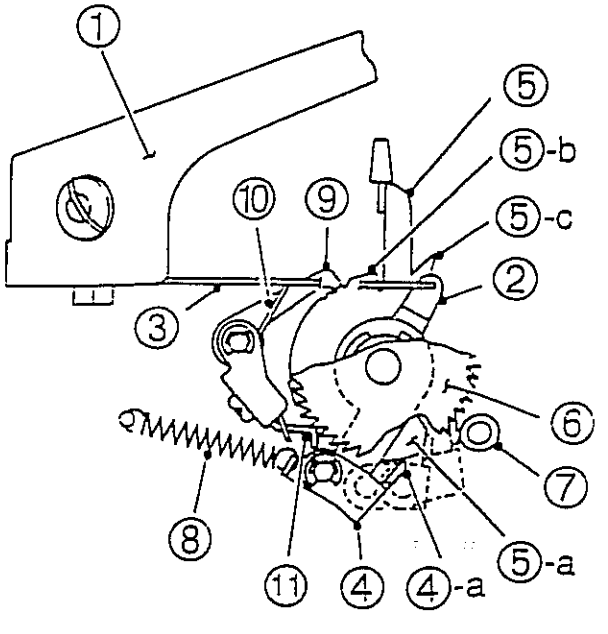
The Detent Arm Spring (10) pushes the Detent Arm (9) into the Line Space Selector (5-b) groove determining the Line Space Selector position. The Detent Arm Spring (10) pushes the Detent Heel (11) between the Line Space Ratchet (6) teeth, determining the position of the Platen.

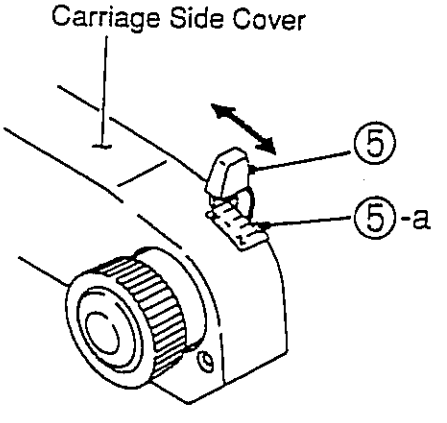
c) **Line Spacing**

When you change the position of the Line Space Selector Indicator (5-c) the position of the Line Spacing Cam (5-a) changes. Thus, the position where the Feed Pawl (4-a) starts to engage with the Line Space Ratchet (4), varies, changing the space of the Platen Line Feed.

R ---------- 0 Feed (Neutralization)
1 ---------- 2 gears (1/6" (4.23 mm)) feed
- (1-1/2) ---- 3 gears (1/4" (6.23 mm)) feed
2 ---------- 4 gears (1/3" (8.46 mm)) feed

LEFT SIDE VIEW



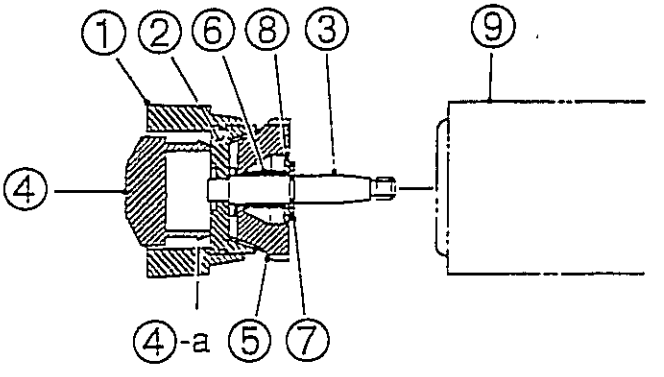


3.3 Variable Line Spacer

The Left Platen Knob (1), the Variable Ratchet (2) and the Platen Shaft (3) complement each other.
The Push Rods (4-a) are pressed into the Push Button (4).
The Spring (6) pushes the Variable Ratchet Wheel (5) engaging it with the Variable Ratchet (2). The part indicated with the number (7) is an E-Ring and the part indicated as (8) is the Spring Pat.
When the Push Button (4) is pressed by the Push Rods (4-a) it presses the Variable Ratchet Wheel (5), which is released from the Variable Ratchet (2), freeing the Platen (9).

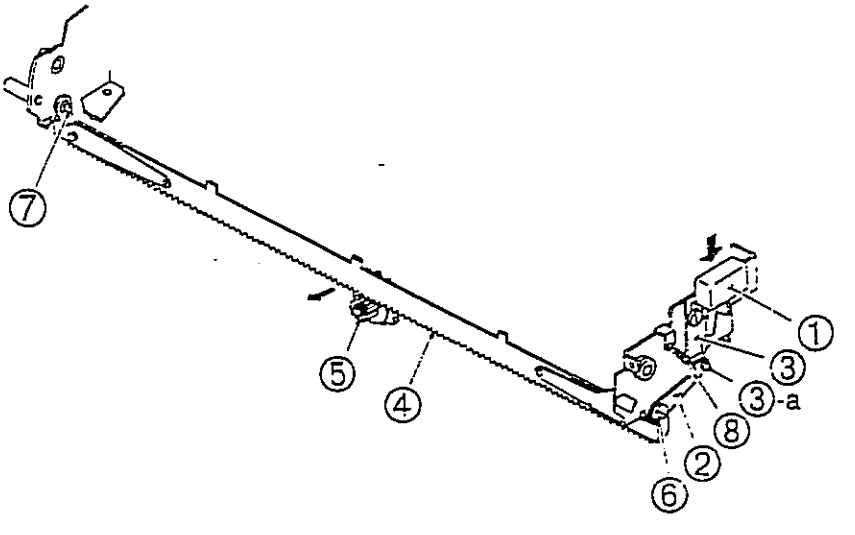
To disassembly this mechanism, remove the E-Ring (7) from the Platen (9). Then, remove the Spring Pat (8), Spring (6) and the Variable Ratchet Wheel (5) from the Platen (9), following this order. The Push Rods (4-a) shall be removed from the Push Button (4).

FRONT VIEW



3.4 Carriage Release

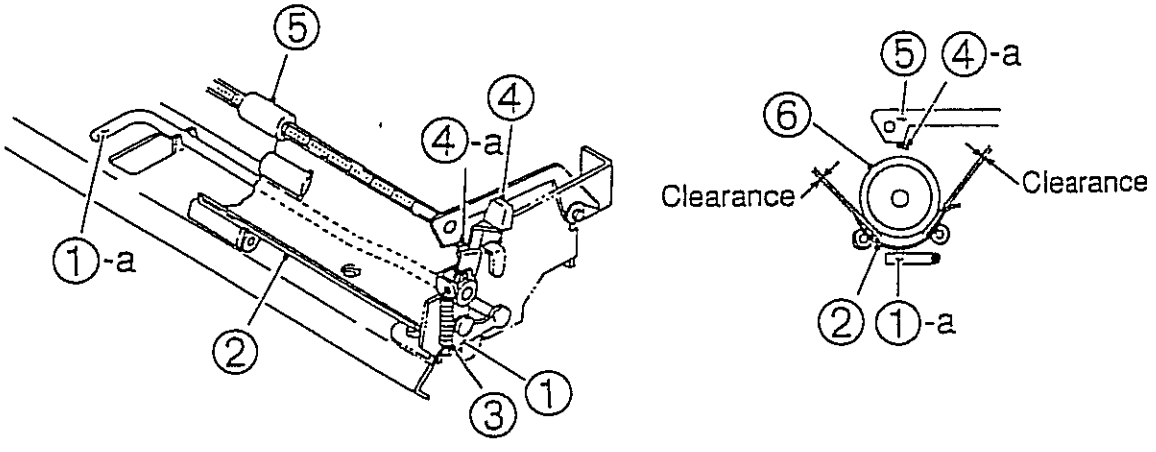
When the Carriage Release Button (1) is pressed, the R Rack Bracket (2) is pushed by the Carriage Release Lever (3) and the Release Lever Pin (3-a). Then, the Carriage Rack (4) is released from the Escape Pinion Gear (5) at the fulcrum of the R & L Rack Retaining Screws (6, 7).
Immediately after, the Release Spring (8) returns the Carriage Release to its original position.



3.5 Paper Release

When you press-down the L-Shaft Arm (1-a), the Spring (3) pushes the Paper Pan (2) towards the Platen side.
When you press the Paper Release Lever (4), the Release Hook (4-a) pushes the L-Shaft Arm (1) detaching the L-Shaft (1-a) from the Paper Pan (2).
When you press the Paper Release Lever (4), the Release Lever (4-a) detaches the Paper Bail Scale Arm (5) from the Platen (6), pushing it upwards.

Released Condition (RIGHT SIDE VIEW)



3.6 Escapement

a) **Normal Position and First Trip**
The Escapement Pinion Gear (1-a) and the Escapement Wheel (1) are integrated in a single assembly.
The Carriage Rack (2) engages with the Pinion Gear (1-a).
The Main Spring slides the Carriage in the direction of the arrow from the loaded position up to the end of its route. However, the turning of the Escapement Wheel (1) is stopped by the Fixed Dog (3) and thus the Carriage does not move.
When you press the Key Lever, it pushes the Type Bar (4) in the direction of the Platen and then the side (a) of the Type Bar (4), pushes the side face (5-a) of the Segment Universal Bar. The tip of the bottom part (5-b) of the Segment Universal pushes the Connection (6) and then the Connection Set Screw (6-a) pushes upwards the Loose Dog (7). The Fixed Dog (3) detaches from the Escapement Wheel (1) matching the movement of the Loose Dog (7).
The Main Spring slides the Carriage in the direction shown by the arrow. The revolution of the Escapement Wheel (1) is stopped by the Loose Dog (7) stopping the movement of the Carriage.

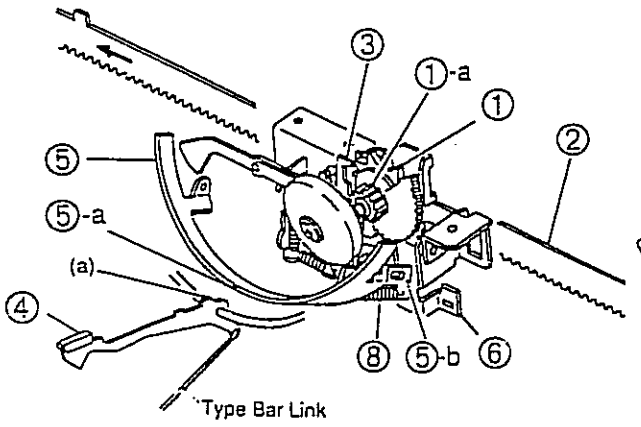
b) **Second Trip**
If you release the Key Lever after the First Trip, the Sub-lever Spring and the Spring Universal (8) return the Type Bar (4) to its home position.
The Loose Dog Spring (9) releases the Loose Dog (7) from the Escapement Wheel (1). Then the force of the Plain Spring moves the Carriage in the direction indicated by the arrow. Next, the Fixed Dog (3) stops the movement of the Escapement Wheel (1), and the Carriage stops.

c) **Silent Return**
The Silent Return (10), pivots on Shaft (11) of the Escapement Wheel; a special Spring (12) holds it pressing the Wheel. When the Carriage moves from the left to the right, the Wheel (1) turns in the direction shown by the arrow (in the direction of (r)), pulling the Silent Return in the same direction. The Arm (10-a) of the Silent Return pushes away the Fixed Dog (3) that is riding on the Wheel teeth. When the Carriage resumes its normal forward movement, the Wheel moves the Silent Return (10) to its home position.

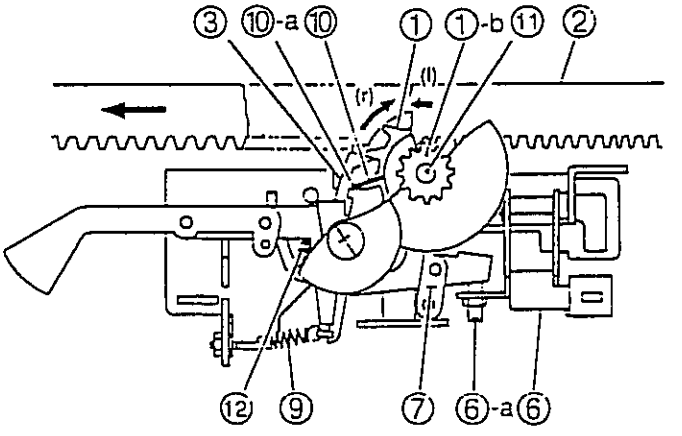
Note:
The carriage of the typewriters to be used in Arabian countries (Arabic arrangement), moves from right to left.
Also, the Wheel (1) turns in the direction indicated by (l).

FRONT VIEW

Type Bar Link

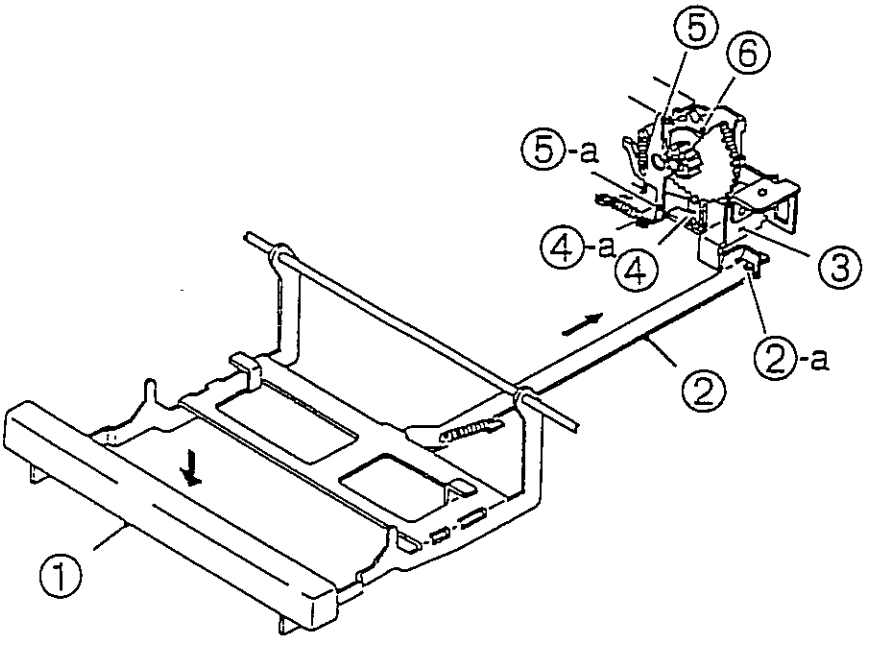


Type Bar Link



3.7 Spacer

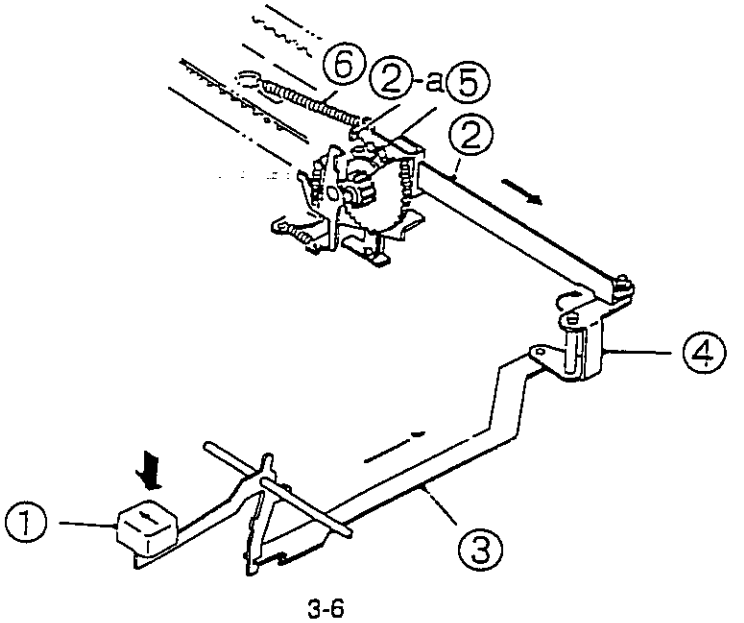
When you press the Space Bar (1), the Space Bar Link (2-a) pushes the Connection (3), in turn, this one pushes the Loose Dog Complete (4-a), which transmits the pressure to the Fixed Dog (5-a). The Fixed Dog (5-a) disengages from the Escapement Wheel (6), and the carriage moves one space.
The Spring (7) returns the Space Bar (1) and the Space Bar Link (2) to the respective home positions.



3.8 Back Space

When you press the Back Space Key (1), the Space Bar Link (3) pushes the Back Space Pawl (2) and the Back Space Crank (4). Thus the Position (2-a) engages with the Escapement Wheel (5) making the Carriage to move back.
The Back Space Spring (6) resets the Back Space Key (1) to its home position.

Note:
The Back Space Pawl (2) of the typewriters to be used in Arabian countries (Arabic arrangement), moves in the opposite direction of the one indicated by the arrow mark.



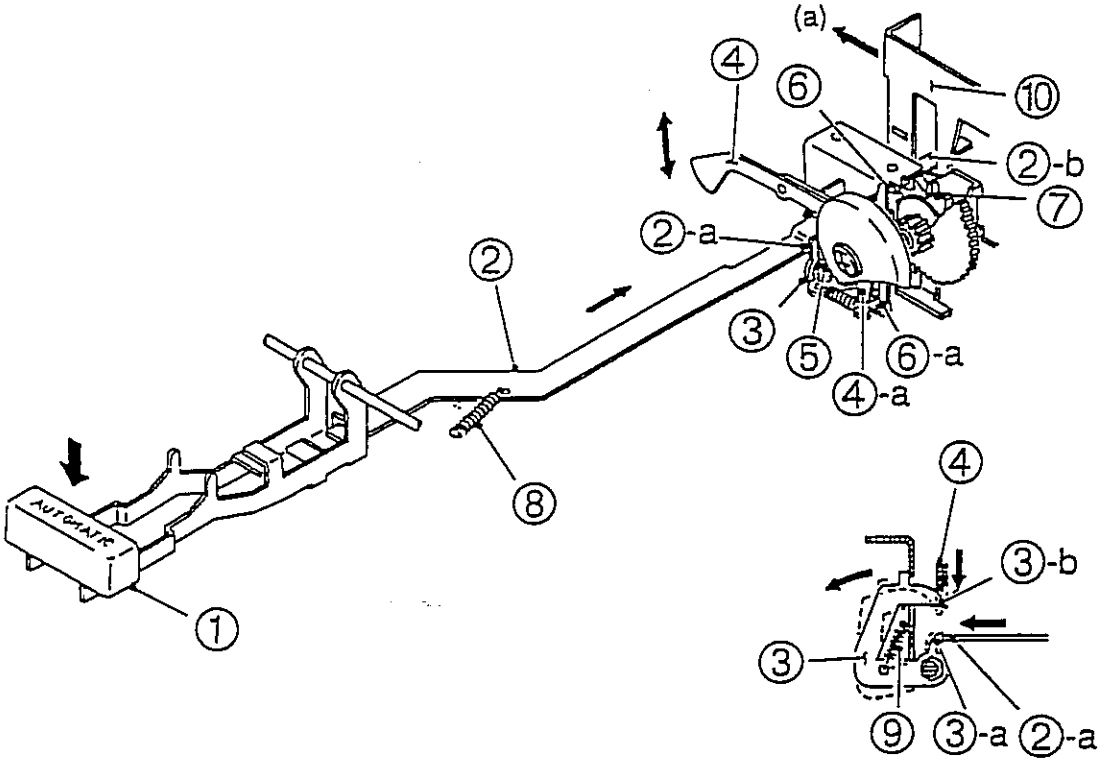
3.9 Automatic Space Repetition

When you press the Automatic Space Repetition Key (1) the Link (2-a) pushes the Swing Controller (3-a). The Swing Controller Spring (5) releases the Swing Dog (4) from the Swing Controller (3-b). Then (4-a) pushes the Fixed Dog (6-a) and the Swing Dog (4) disengages from the Escapement Wheel (7) freeing the Carriage that moves to the left side. If you keep pressing the Automatic Space Repetition Key (1), the Swing Dog (4) continues swinging, resulting in the continuous movement of the carriage towards the left.

a) **Automatic Space Repetition Reset**
When you free the Automatic Space Repetition Key (1), the Return Stop Spring (8) returns the Automatic Space Repetition Key (1) and the Space Repetition Link (2) to their respective home positions.
The spring (9) resets the Swing Controller (3) to the home position and the Swing Controller (3-b) resets the Swing Dog (4) to the home position.

b) **Margin Lock using Space Repetition**
When you set a margin lock, the Carriage Stopper (10) moves in the direction of (a) pushing the Space Repetition Link (2-b). This in turn, releases the Space Repetition Link (2-a) from the Swing Controller (3-a), returning the Swing Controller (3) to the home position. The Swing Dog (4) stops, and thus the Carriage stops.

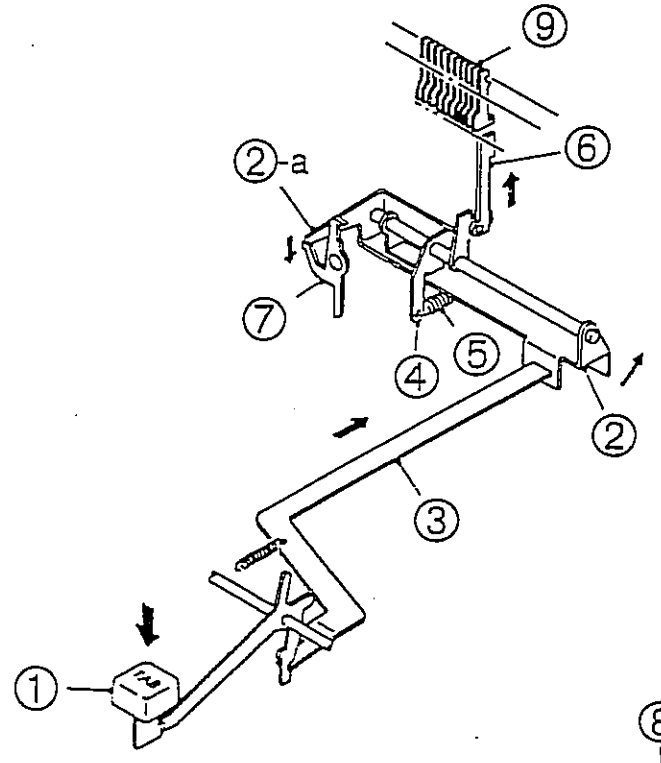
Note:
The Carriage Stopper (10) of the typewriters for Arabian countries (Arabic arrangement) moves in the opposite direction of the one shown by the arrow mark.

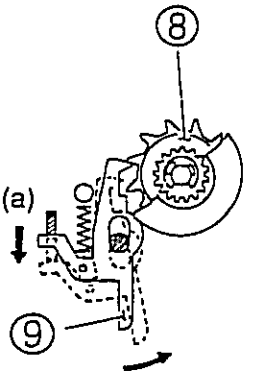


3.10 Tabulator

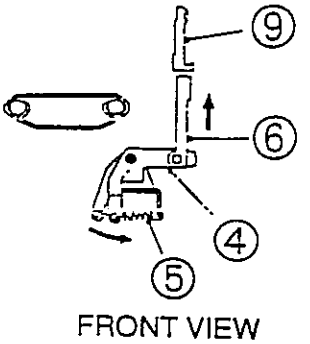
When you press the Tab Key (1), the Tabulator Link (3) rotates the Tabulator Main Bar (2). The Spring (5) rotates the Tab Stopper Lift Crank (4), raising the Tab Stopper (6).
When the Tabulator Main Bar (2-a) rotates the Fixed Dog (7), it disengages from the Escapement Wheel (8) and the Carriage moves to the left. The Tab Chip (9) set for the Tab, contacts the Tab Stopper (6).
When you lift your finger from the Tab Key (1), the Tab Stopper (6) detaches from the Tab Chip (9), and the Carriage moves to the left. The return of the Fixed Dog (a) to its home position stops the rotation of the Escapement Wheel (8), so the Carriage stops at the position where you set the Tab.

Note (Arabic Arrangement Models Only):
The Carriage braking is done by the Brake Shoe which is glued to the Brake Arm. When the Tabulator Main Bar rotates, the Spring rotates the Brake Arm which touches the Carriage Rail braking the movement of the Carriage. The Carriage can be released only after the Tab Stopper and the Brake Shoe are completely set.





RIGHT SIDE VIEW



FRONT VIEW

3.11 Tabulator Set/Clear

a) **Tab Setting**
Place the Carriage in the position where you want to set a Tab Stop (operating the Space Repetition or other means). When you place the Tab Set Lever (1) to the (+) setting, the Tab Set Finger (2) moves to the Tab Set First Link (3) and the Second Link (4) and (2-a) engages the Tab Chip (5).

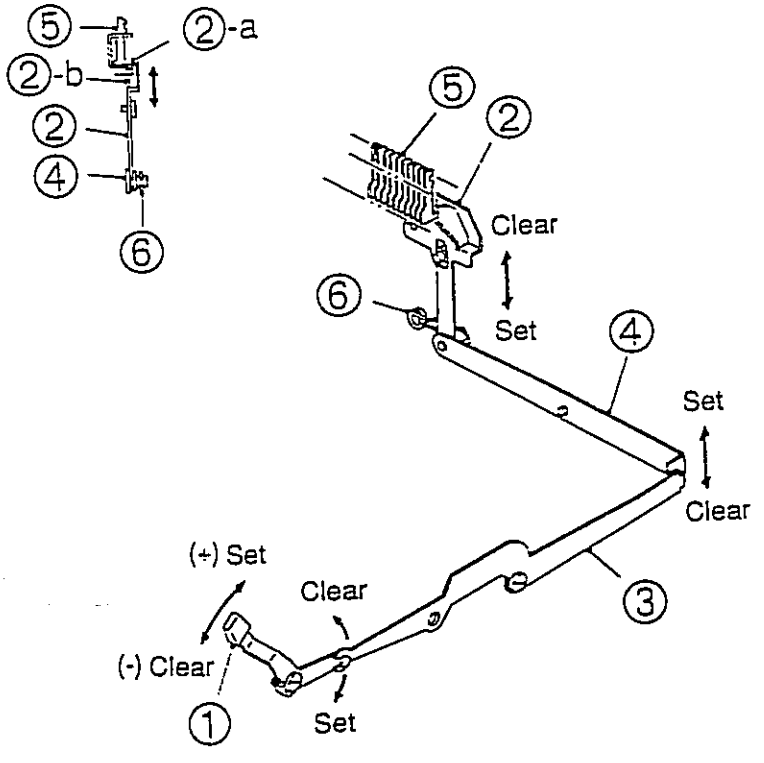
b) **Tab Clearing (Clearing a Single Tab Chip)**
When you press the Tab Key, the Carriage stops at the position where the Tab Chip (5) was set. If you operate the Tab Set Lever (1) moving it to the Clear (-) position, the Tab Set Finger (2-b) returns the previously set Tab Chip (5) to its original position.

c) **Clearing All Tabs**
Move the Carriage up to the right end stop. When you press the (-) Clear Tab Set Lever (1), the Carriage moves to the left and the Set Finger (2-b) returns the previously set Tab Chips (5), to their home positions.

d) **Tab Set Lever Return**
The Neutral Torsion Spring (6) returns the Tab Set Lever (1) and the Tab Set Finger (2) to their original positions.

e) **Cautions for Tab Setting**
When performing the tab setting, move the Carriage (space) after the Tab Set Lever (1) returns to its home position.

RIGHT SIDE VIEW



3.12 Margin Stops

a) **Setting Margin Stops**
The Margin Rack (1) is mounted on the Carriage Slide Plates L (2) and R (3) with Nut (4). The Margin Stop L (5) and R (6) are retained by Spring (7) and can be set at any position on the Margin Rack (1). (Figure 3.12-1)

b) **Starting Typing (on a line)**
The tension of the Spring (10) determines the position of the Carriage Stopper (8) through the Carriage Stopper Bracket (9).

c) **Ending Typing (on a line)**
Set the Margin Stop R (6) where you want the written line to end. (Figure 3.12-2). When the Carriage moves to the left (while you are typing), the Margin Stop R (6-a) contacts the Carriage Stopper (8-a) and the Carriage Stopper (8-b) contacts the Back Frame (10-a), stopping the movement of the Carriage Stopper (8) and thus the Carriage slide. (Figure 3.12-2)

d) **Shift Lock Key**
The function of the Shift Lock Key (11) is to stop the operation of Connection (12). When the Carriage Stopper (8-a) slides by the Margin Stop R (6-a), the Margin Lock Setter slides together with the Carriage Stopper (8-a). The Spring (14) moves the Margin Lock Plate (13) which locks the Connection (12-a) stopping the Connection (12). (Figure 3.12-1)

Figure 3.12-1

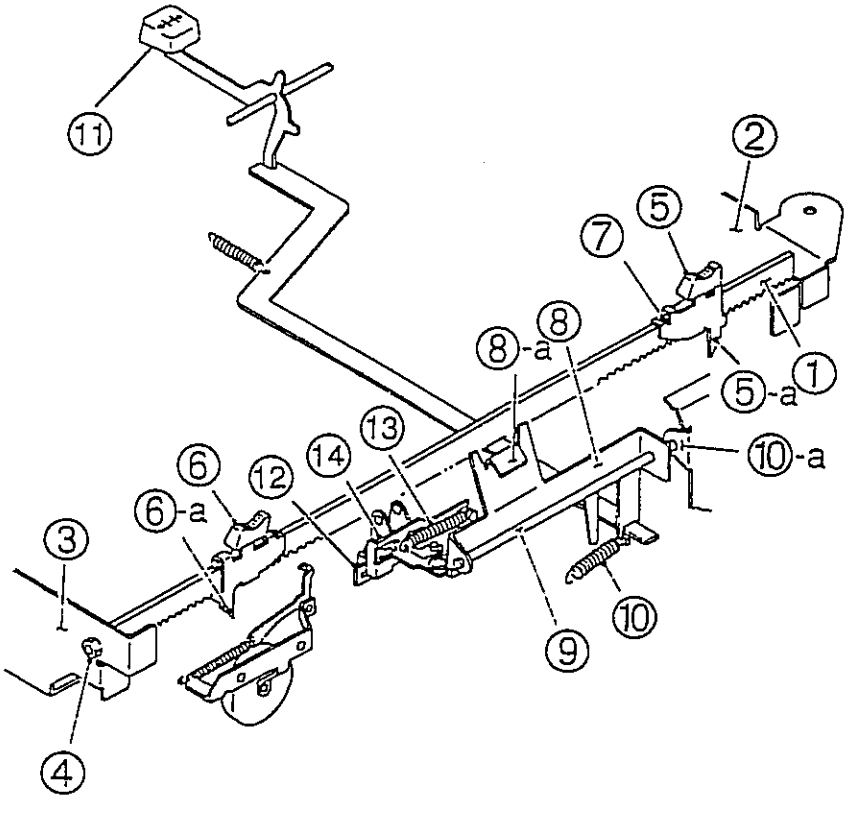
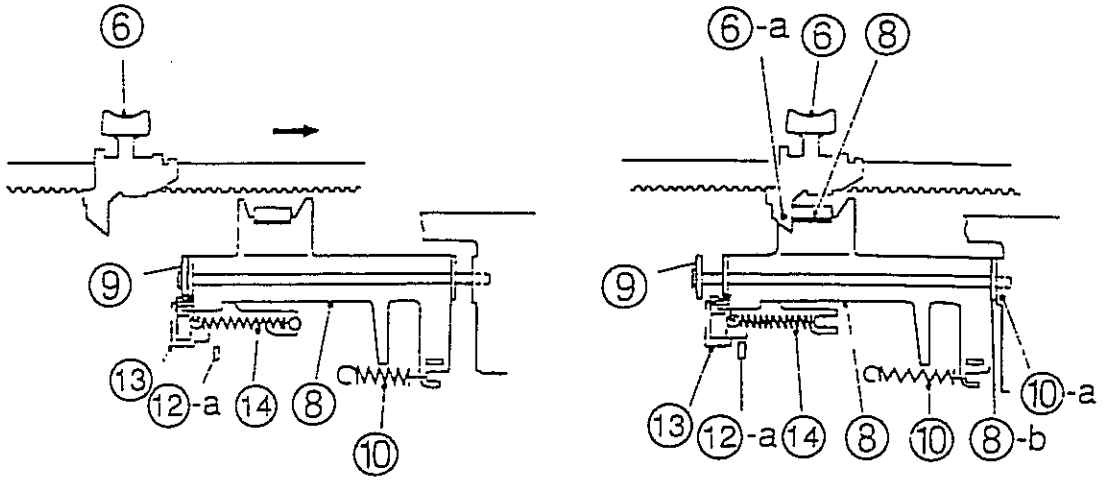


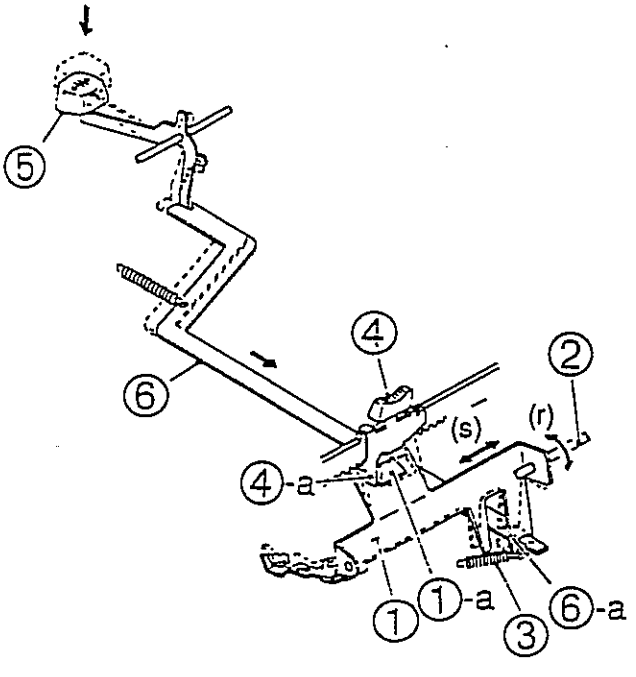
Figure 3.12-2 (REAR VIEW)



3.13 Margin Release

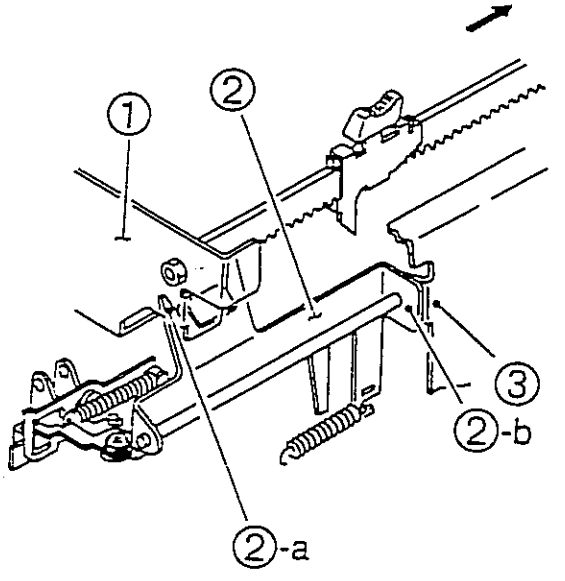
The Carriage Stopper (1) makes a linear (s) and a revolving (r) movement around the Stopper Shaft axis (2). The Carriage Stopper Spring (3) returns the Carriage Stopper (1) to its home position.
When the Margin Stop R (4-a) contacts the Carriage Stopper (1-a), it locks the margin.

Margin Lock Release Operation
When you press the Margin Release Key (5), the Margin Link (6-a) pushes the Carriage Stopper (1), releasing (1-a) from the Margin Stop (4-a).
When you lift your finger from the Margin Release Key (5), the Margin Release Key (5) and the Margin Link (6) return to their original positions.



3.14 Carriage Final Stop

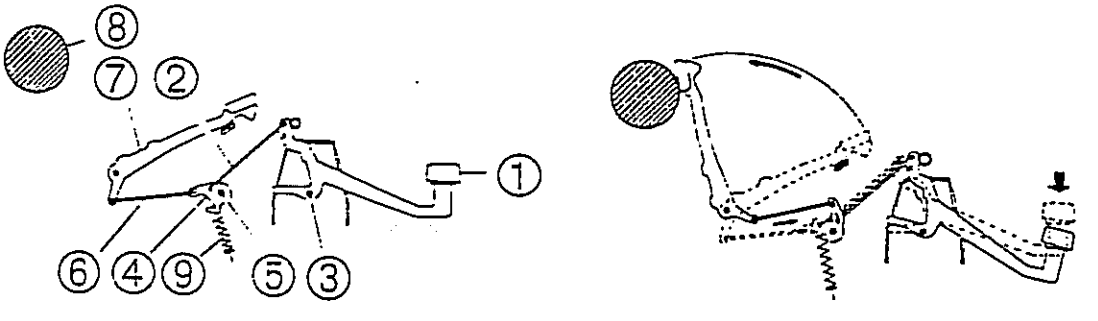
Final Lock (Carriage Lock) Operation
When the Carriage moves to the left, the side Plate (1) of the Carriage contacts the Carriage Stopper (2-a) which starts sliding. When the Carriage Stopper (2-b) contacts the Back Frame (3), the movement of the carriage stops.



3.15 Type Bar Operation

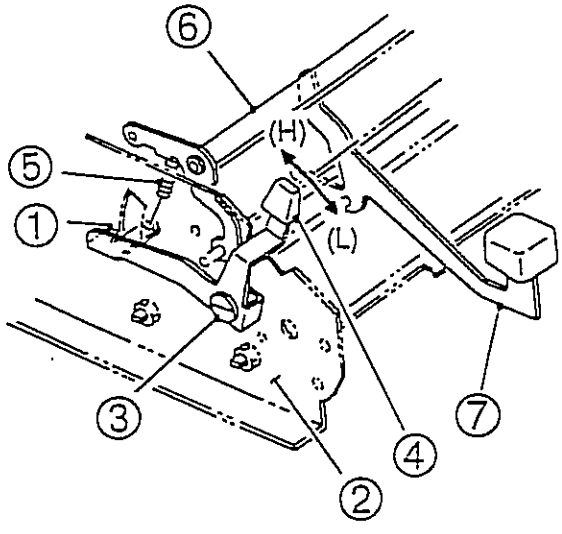
When you press the Key (1), the Key Lever Link (2) pulls in a circular movement, (having as center the Key Lever Shaft (3)), the Key Lever Link (2) and the Sub-lever (4). The Sub-lever (4) rotates around the Sub-lever Shaft (5). This rotation pulls the Type Bar Link (6) making the Type Lever (7) to strike the paper rolled around the Platen (8).
The Sub-lever Spring (9) resets the Key Lever (1) and the Type Bar (7) to their respective home positions.

LEFT SIDE VIEW



3.16 Type Bar Touch Control

The Screw (3) presses the Touch Control Lever (1) tightly against the Side Frame L (2). When you move the Touch Control Lever Knob (4) to the H-L direction, the stretching of the Touch Control Lever Spring (5) varies, changing the force of the Ribbon Universal (6) operation (force of the Key stroke), controlling in this way the touch of the Key Lever (7).



3.17 Segment Shifting

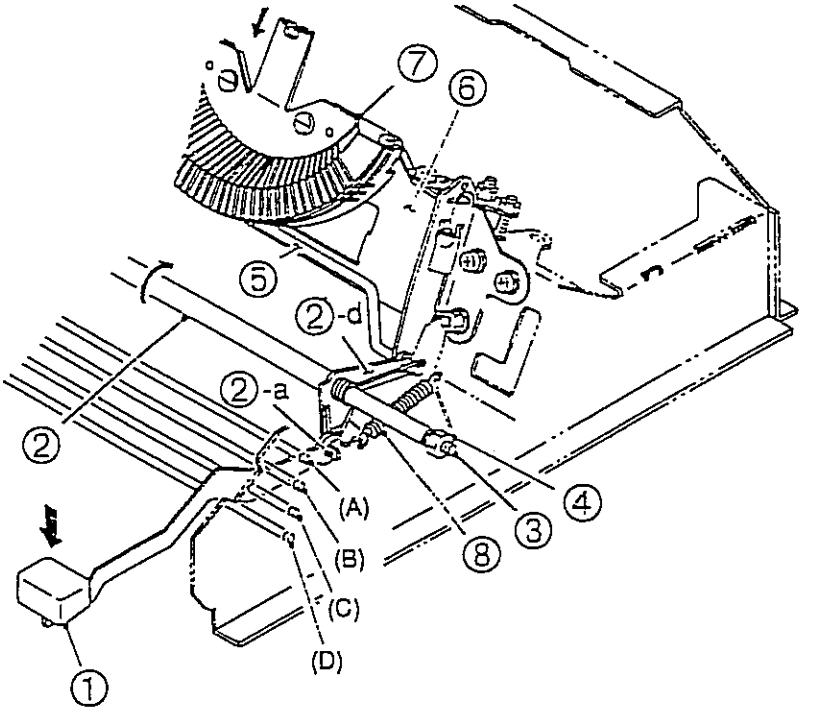
a) **Segment Shifting Operation**
The Shift Key Lever (1) rotates having as center the Key Lever Shaft (C). The Shift Center (3) and the Nut (4) stop the rotation of the Torsion Bar (2) at the L and R Side Frames. The Torsion Bar (2-a) is connected with the Shift Lever (1), and the Torsion Bar (2-b) is connected with the Segment Hanger Shaft (5) and the Segment Base (6).
The Segment (7) is mounted on the Segment Base (6) pressing down the Segment Hanger Shaft (5) and the Segment Base (6), shifting the Segment (Type Bar) to the Lower Case Position (Capital Letter).
When you release the Shift Key (1), the Shift Spring (8) returns the Torsion Bar (2) to the home position resetting in turn the Shift Lever (1) and the Segment Base (6) to their original positions.

b) **Lower Case Position (Capital Letter) (Figure 3.17-2)**
The positions are determined by the Lower Case Position Screw (9), the Rubber Cap (10) and the Nut (11).

c) **Upper Case Position (Small Letter) (Figure 3.17-3)**
The positions are determined by the Upper Case Position Screw (12), the Nylon Washer (13) and the Nut (14).

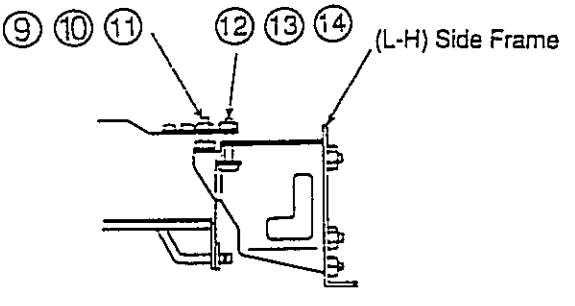
a) Segment Shifting Mechanism

Figure 3.17-1



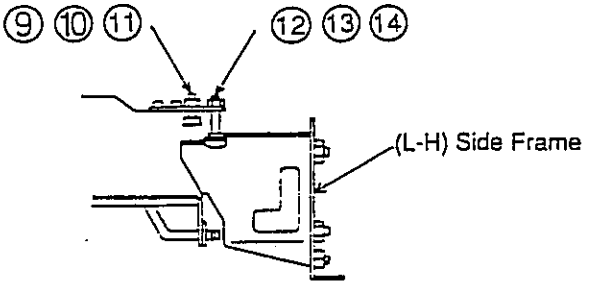
b) Lower Case Position

Figure 3.17-2 (FRONT VIEW)



c) Upper Case Position

Figure 3.17-3 (FRONT VIEW)

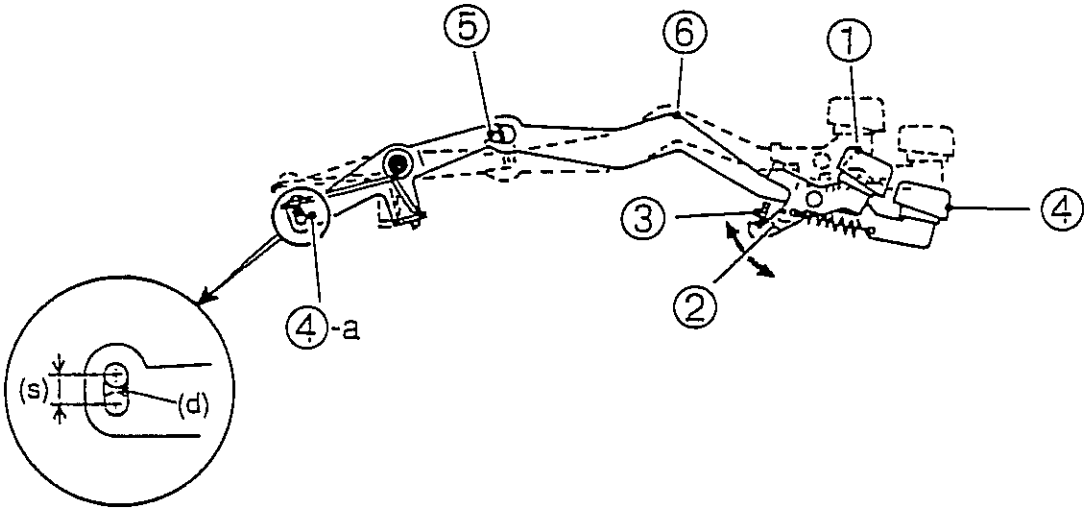


3.18 Shift Lock

a) **Shift Lock Operation**
When you press the Shift Lock Key (1), the tip of the Shift Lock Lever (2) engages with the Shift Lock Fitting (3).

b) **Shift Lock Release Operation**
When you press the Shift Key (4), the Torsion Bar (4-a) rotates the pitch (s) of the "oval hole (d)" located in the Torsion Bar (5). The Shift Lever (6) goes down the length of the stroke (s), disengaging the Shift Lock Lever (2) from the Shift Lock Fitting (3).

LEFT SIDE VIEW

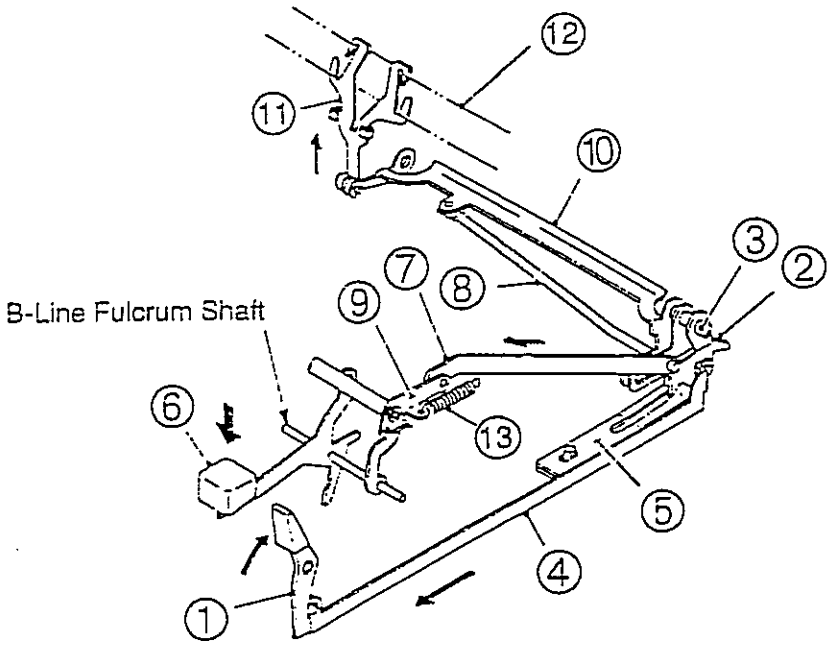


3.19 Color Selection and Ribbon Lifting

a) **Color Selection Operation**
When you operate the Color Selector (1), Color Selection Link (4) rotates the Cam Lever (2) around the Shaft (3).
The Cam Lever (2) has 3 Cams (2-a, 2-b and 2-c). The position (2-a) corresponds to "Red", position (2-b) corresponds to "Black" and position (2-c) corresponds to "Stencil".
The Color Selection Detent Spring (5) retains the Cam Lever (2) in the "selected color" position.

b) **Ribbon Lifting Operation**
When you press Key (6), the Ribbon Universal Bar (9) pulls the Ribbon Lifting Link (7) and the Ribbon Lifting Bar (8). Then, the Ribbon Lifting Crank (10) revolves around Shaft (3), the Vibrator (11) rises, lifting the Ribbon (12).
When you release Key (6), the Universal Bar Spring (13) resets the assembly to its original position.

c) **Ribbon Lifting Level**
The Cam Lever (2) guides the Ribbon Lifting Crank (10) that rotates the Ribbon Lifting Bar (8).
If you change the position of the Color Selector (1) the position of the Cam Lever (2) changes, varying the revolving angle (around shaft (3)), of the Ribbon Lifting Crank (10), changing the level of the Ribbon Vibrator (11).


B-Line Fulcrum Shaft
⑫
⑪
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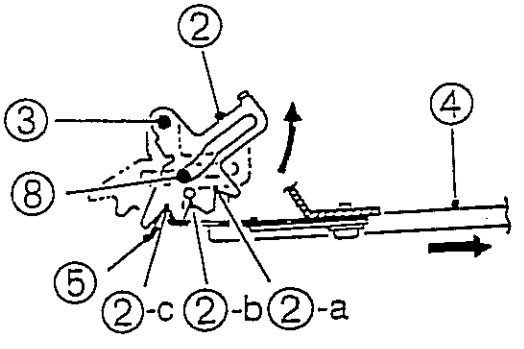
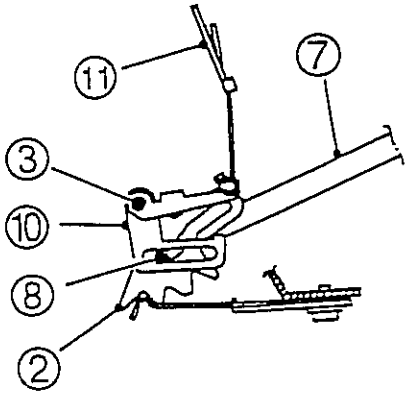

②
③
④
⑧
⑤
②-c
②-b
②-a


⑪
⑦
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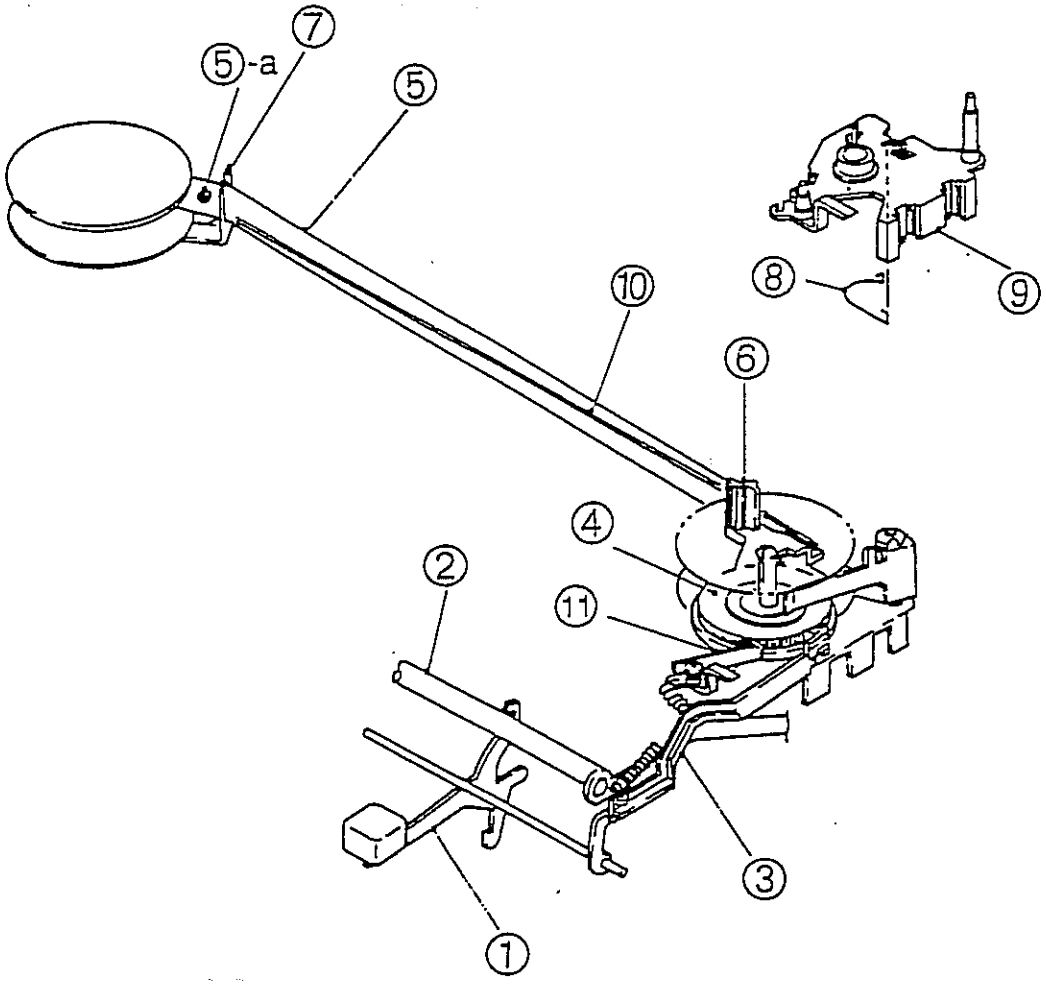
⑩
⑧
②

3.20 Ribbon Feeder

a) **Ribbon Feeder Operation**
When you press the Key Lever (1) the Ribbon Universal Bar (2) pulls the Ribbon Feeding Arm (3) that engages with the Ribbon Feeding Gear (4) rotating it.

b) **Change of the Ribbon Winding Direction**
The ribbon winding direction automatically changes when the Eyelet Hole (5-a) of the Ribbon Tape (5) pulls the Ribbon Arms (6, 7) inward.
The Reverse Spring (8) and the Ribbon Base (9) notches hold the Ribbon Arms R (6) and L (7) in a certain position. The two Arms are connected between them by the Ribbon Control Link (10). The Gear Stopper (11) is mounted on the Ribbon Arms (6,7) and engages with the Ribbon Feeding Gear (4) preventing the rewinding. At the same time, the Ribbon Control Link (10), pushes the ribbon feeding system of the opposite side, making it free.



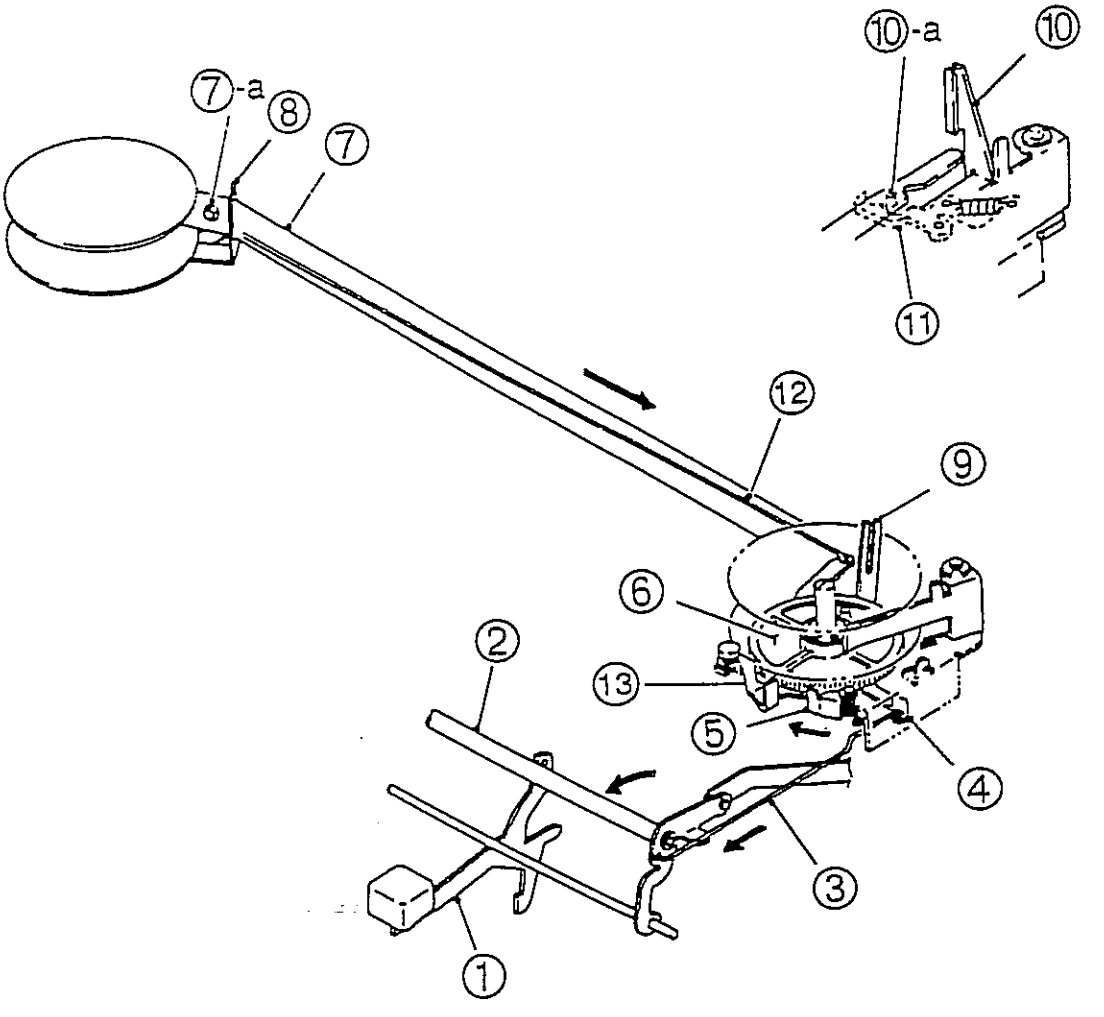
DIN-Type

a) **Ribbon Feeding**

When you press the Key Lever (1) the Ribbon Universal Bar (2) pulls the Ribbon Feeding Link (3) and the Ribbon Feeding Lever (4), engaging the Gear Feed Pawl (5) with the Ribbon Ratchet Gear (6), rotating it.

b) **Ribbon Winding Direction Change**

The ribbon winding direction automatically changes when the Eyelet Hole (7-a) of the Ribbon Tape (7) pulls the Reversing Levers (8, 9) inward.
The Reversing Lever (8) and (9) are retained in a certain position by the Reverse Lever Pin (10-a) and the Reverse Cam (11), the 2 Levers are connected between them by the Reversing Ring (12). The Gear Retaining Pawl (13) is mounted on the Reversing Lever (10) and engages with the Ribbon Ratchet Gear (6) preventing the rewinding. At the same time, the Reversing Ring (12), pushes the ribbon feeding system of the opposite side, making it free.



4. CHECKS AND ADJUSTMENTS

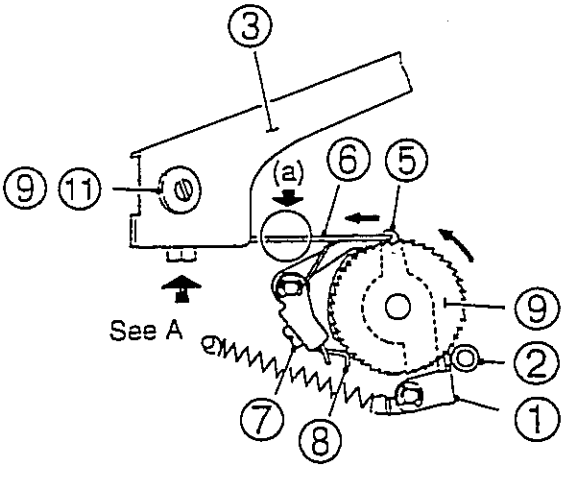
4.1 Line Spacing

a) **Number of Spaces Between Lines**
When you operate the Return Handle (3), the Line Space Feeder Pawl (1) acts on the Stopper Pawl (2). In this operation, the gap between the Return Handle Bracket (4) and the Stopper Pin (5) is 0.008 ~ 0.02" (0.2 ~ 0.5 mm).
The adjustment of this gap is made by shaping the Part (a) of the Line Spacing Link (6).

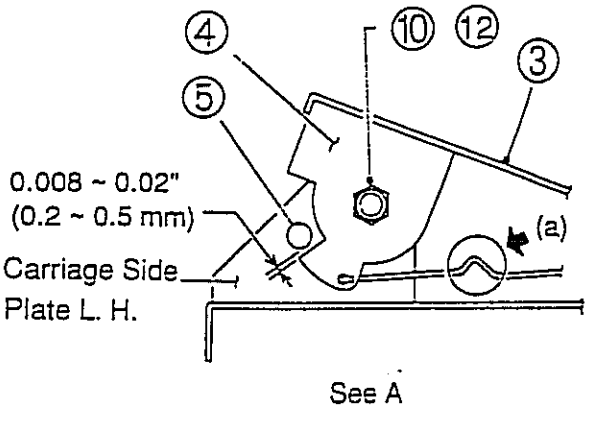
b) **Detent Heel**
This adjustment shall be performed after the above mentioned Line Spacing Adjustment, or after checking the 0.008 ~ 0.02" (0.2 ~ 0.5 mm) gap.
Unscrew the Screw (7) and adjust the Detent Heel (8) in such a way that it protrudes between the Ratchet Wheel (9) when the Line Space Feeder Pawl (1) contacts the Stopper Pawl (2).

c) **Return Handle**
The Return Handle (3) can be adjusted to have a soft or hard operation using the Lever Set Screws (9, 10) and the Nuts (11, 12).

LEFT SIDE VIEW



BOTTOM VIEW



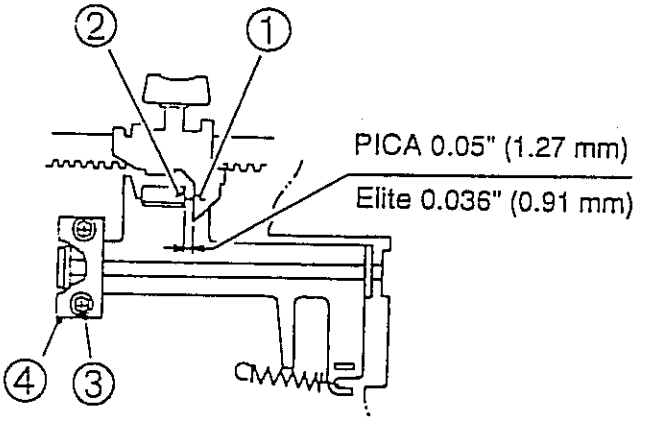
4.2 Before Typing

a) **Adjusting the Gap Before Typing**
The gap between the Left Margin Stop (1) and the Carriage Stopper (2) shall be:

PICA ------- 0.05" (1.27 mm)
ELITE ------ 0.036" (0.91 mm)

1) To adjust the position of the Stopper Bracket (4) mounted on the Back Frame, unscrew the 2 Screws (3) and move the Stopper Bracket (4) to the right or to the left.

REAR VIEW

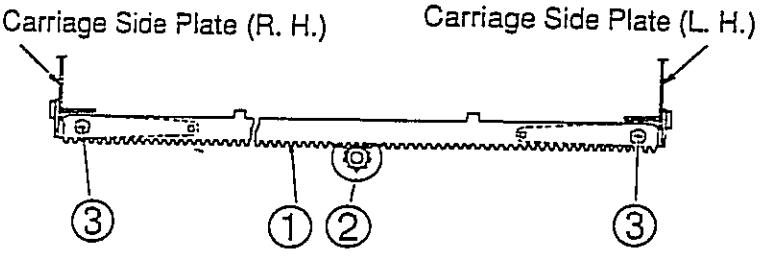


4.3 Carriage Rack

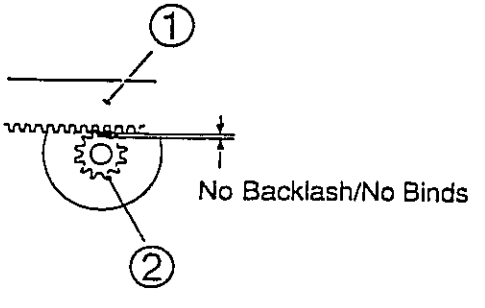
Adjustment of the engagement deepness between the Carriage Rack and the Pinion Gear (2). The engagement gap between the Carriage Rack (1) and the Pinion Gear (2) shall be mesh smoothly with no backlash/binds, (left side, right side and center).

1) The Carriage Rack (1) shall be adjusted upwards/downwards after unscrewing the Screws (3) located at the left and right end of the Carriage Rack (1).

TOP VIEW



REAR VIEW

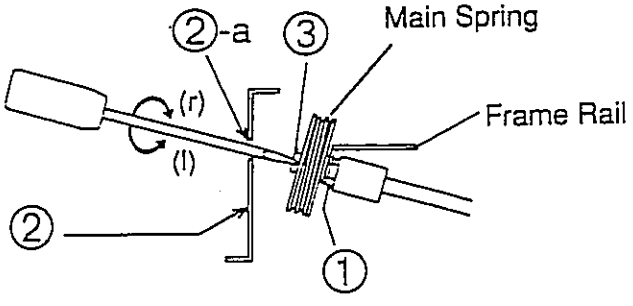


4.4 Main Spring

To adjust the tension of the main spring, hold the Nut (1) with a Box Driver and place the Driver into the hole (2-a) of the Back Frame (2), then, rotate the Main Spring Screw (3).

Clockwise (r) ---------- Increases the pulling force
Counterclockwise (l) --- Reduces the pulling force

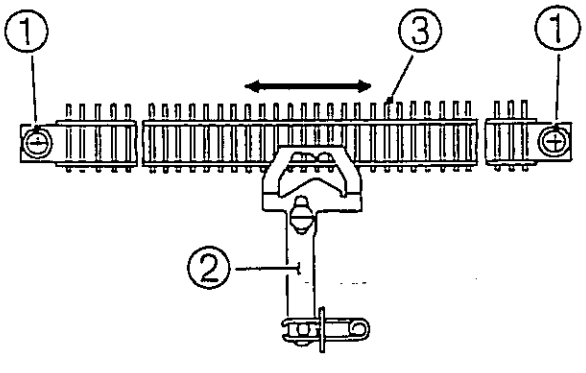
LEFT SIDE VIEW



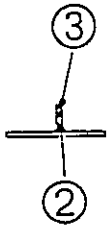
4.5 Tab Rack

Unscrew the Screws (1) and adjust the Tab Rack in such a way that the Shank of the Tab Set/Clear Finger (2) and the Tab Chip (3) match.
The hooking length between the Tab Set/Clear Finger (2) and the Tab Chip (3), shall be 0.059 ~ 0.079" (1.5 ~ 2.0 mm).
If the Tab Set/Clear Finger (2) does not engage with the Tab Chip (3) when setting a Tab, shape the part shown by (f).

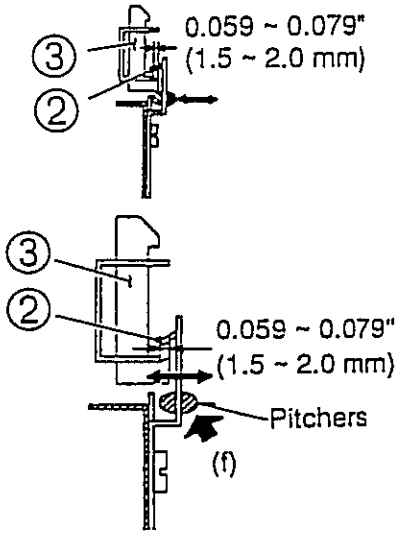
REAR VIEW



TOP VIEW



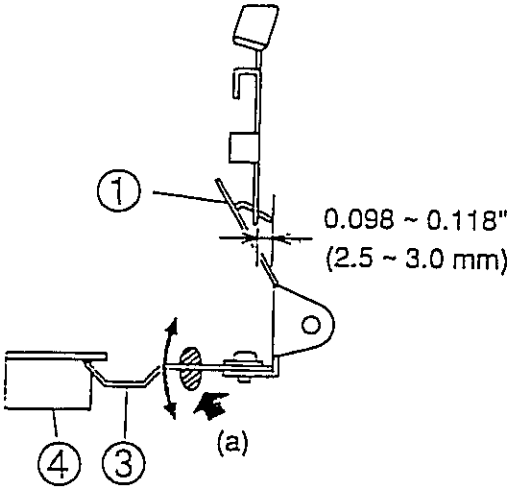
LEFT SIDE VIEW



4.6 Carriage Stopper

The distance between the Carriage Stopper (1) and the Margin Stop (2) shall be 0.098 ~ 0.118" (2.5 ~ 3.0 mm). The Escapement Base (4) stops the Margin Lock Setter (3) in relation with the Carriage Stopper (1).
The adjustment of the mentioned distance is made by shaping the Part (a) of the Margin Lock Setter (3).

LEFT SIDE VIEW

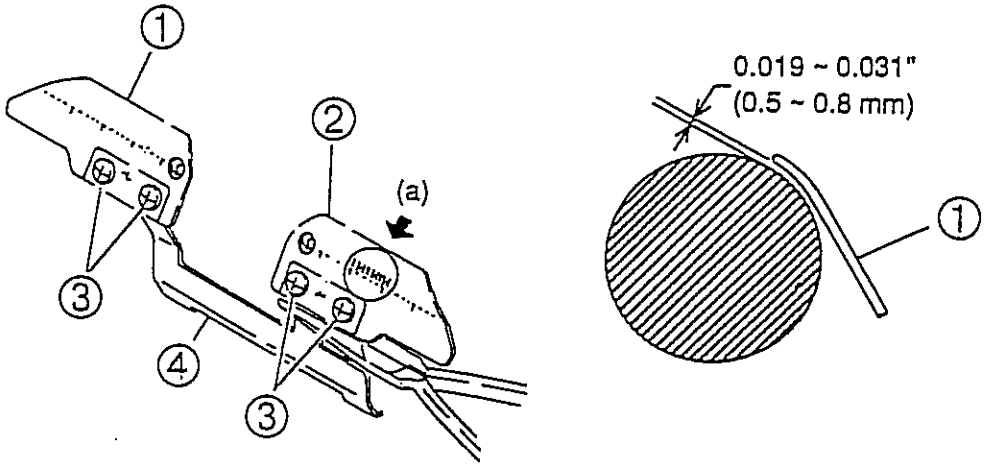


4.7 Line Locator

1) To adjust the position of the Line Locators L (1) and R (2) proceed as follows:
The typing shall be made in a straight line as "HIHIHI....." (see (a)). Unscrew the Screw (3) and adjust the line locator in such a way that its horizontal line is located a little bit lower than the bottom line of the character, while its vertical line is aligned with the center of the character.

2) The gap between the Line Locator and the Platen shall be 0.019 ~ 0.031" (0.5 ~ 0.8 mm). To adjust this gap, shape the Line Locator support (4).

RIGHT SIDE VIEW

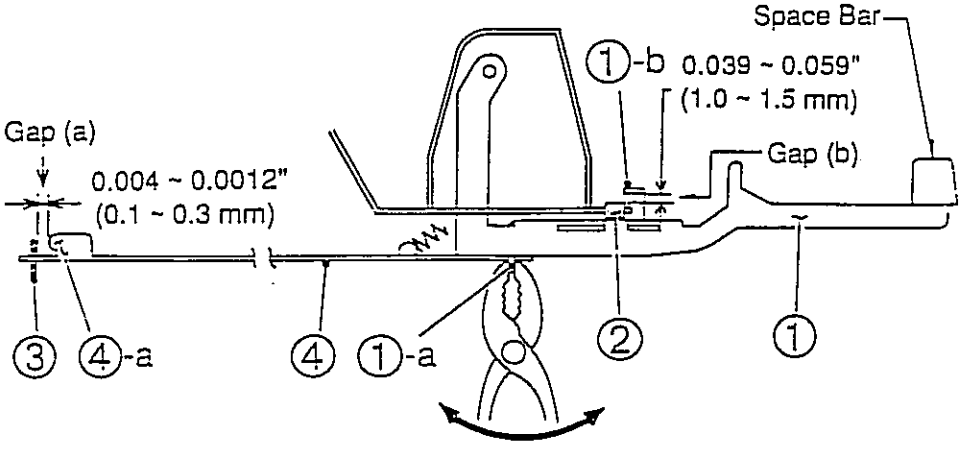


4.8 Space Bar Lever

1) The Space Bar Lever (1) is separated from the Stopper Rubber (2) by a gap (b) of 0.039 ~ 0.059" (1.0 ~ 1.5 mm). The adjustment of the Space Bar Lever (1) gap is made by rising or lowering the Stopper (1-b).

2) The gap (a) between the Connection (3) and the Space Bar Link (4-a) must be 0.004 ~ 0.0012" (0.1 ~ 0.3 mm).
To adjust this gap, shape the Space Key Lever Push Part (1-a).

LEFT SIDE VIEW



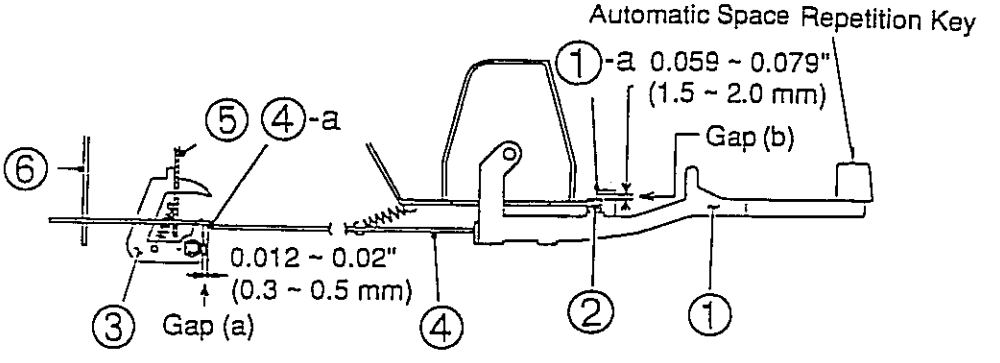
4.9 Space Repetition Key

1) The gap between the Automatic Space Repetition Key Lever (1) and the Stopper Rubber (2) is 0.059 ~ 0079" (1.5 ~ 2.0 mm), gap (b). To adjust the gap of the Automatic Space Repetition Key Lever (1) rise or lower the Stopper (1-a).

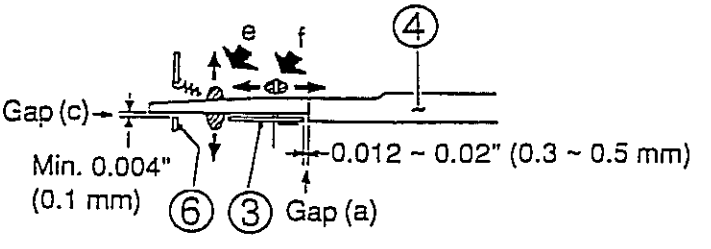
2) The gap between the Swing Controller (3) and the Shank (4-a) of the Space Repetition Link must be 0.012 ~ 0.02" (0.3 ~ 0.5 mm), gap (a).
To adjust this gap, shape the part marked with the arrow (f), at the Escapement Base (5).

3) To adjust the Margin Lock in the Space Repetition, shape the part indicated with the arrow (e) at the Space Repetition Link. The gap between the Carriage Stopper (6) and the Space Repetition Link (4) must be 0.04" (0.1 mm), minimum, gap (c).

LEFT SIDE VIEW



TOP VIEW



4.10 Segment Position and Segment Shifting

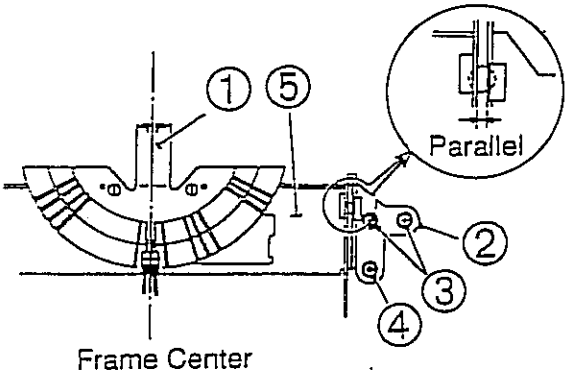
1) The Type Bar Guide (1) shall be at the center of the typewriter body frame.

2) To adjust the centering move the Slide Guides R (2) and L, to the right or to the left, after unscrewing the Screw (3) and the Nut (4), used to mount both slide guides.

3) Segment Shifting
The Segment shifting shall be smooth, when the you press the Shift Key. If it is not smooth, and there is Segment friction, adjust the slide Bases R (2) and L after unscrewing the Screw (3) and the Nut (4).

Note:
The Slide Guides R (2) and L must be installed parallel to the Segment Base (5).

TOP VIEW

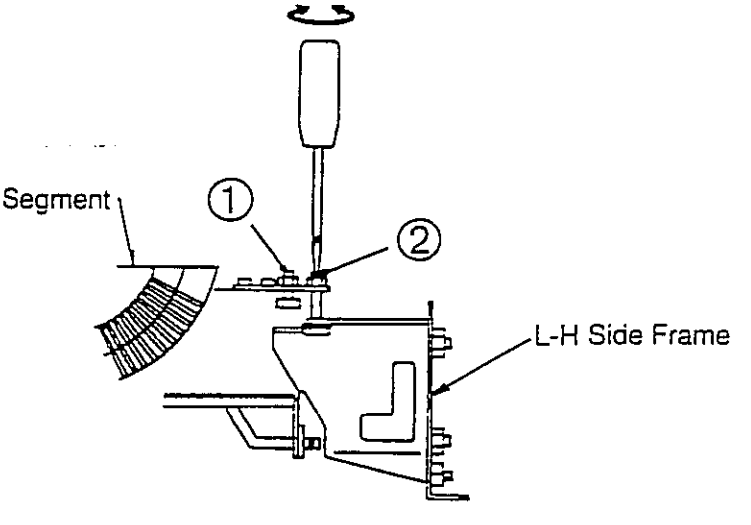


4.11 Capital and Small Letters

1) To adjust the capital letters screw or unscrew the Lower Stopper Screw (1). To adjust the small letters, screw or unscrew the Upper Stopper Screw (2).

2) The Lower Stopper Screw (1) and the Upper Stopper Screw (2) are mounted at both sides of the segment. Their mounting position shall be reciprocally symmetrical.
The screws have a clamping nut to prevent unscrewing.

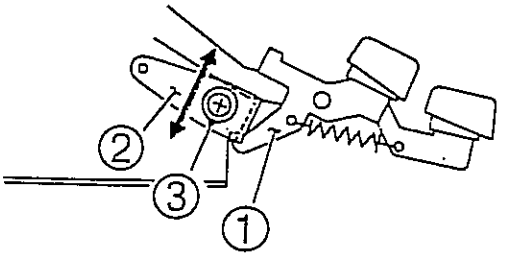
TOP VIEW



4.12 Shift Lock

The Shift Locking Lever (1) shall be correctly located adjusting the Shift Locking Plate (2) upwards/downwards after unscrewing the Screw (3) used to mount this Plate (2).

LEFT SIDE VIEW



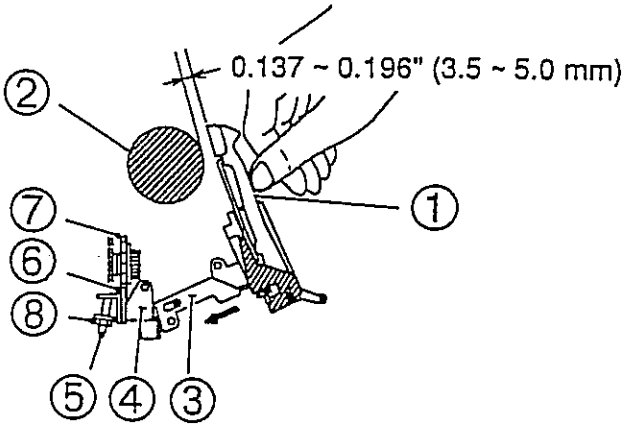
4.13 Escapement Trip

When the Type Bar (1) reaches a position where it is at 0.137 ~ 0.196" (3.5 ~ 5.0 mm) from the Platen (2) surface, the Carriage shall move half space.

Operation
When the Type Bar (1) reaches a position where it is at 0.137 ~ 0.196" (3.5 ~ 5.0 mm) from the Platen (2) surface, the Universal (3) pushes the Connection (4), the Adjuster Screw (5) presses the Loose Dog (6), and the Escapement Wheel (7) rotates half pitch.

1) The Trip is adjusted rotating the Adjuster Screw (5) mounted on the Connection (4). The Part (8) is a nut clamping the Adjuster Screw (5).

LEFT SIDE VIEW



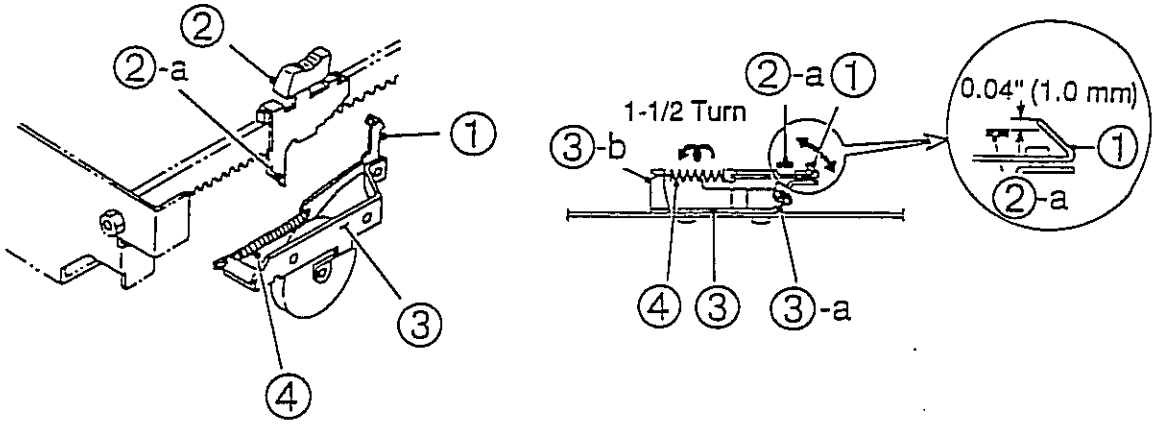
4.14 Bell Hammer

The carriage stops at the Margin Stop after moving 5 to 7 characters after the sound of the bell.

1) The distance between the Bell Hammer (1) tip and the Shank (2-a) of the Margin Stop (2) shall be 0.04" (1.0 mm).
   To adjust it, shape de Bell Base (3-a).

2) Hook the Bell Spring (4) 1-1/2 revolution turned on the Bell Base (3-b).

TOP VIEW

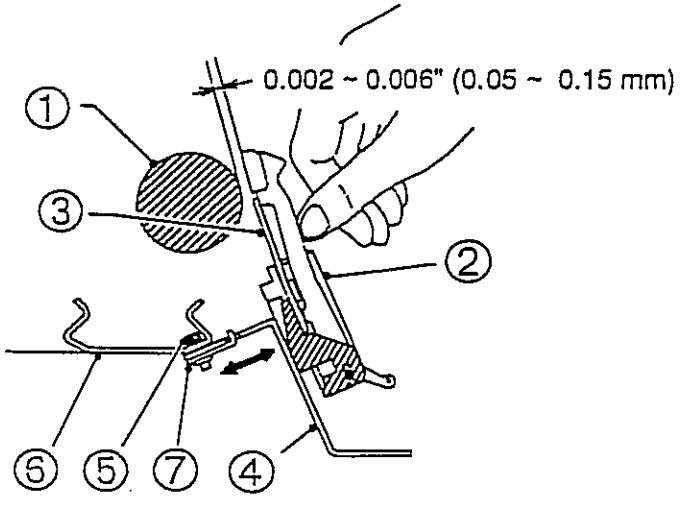


4.15 Ring and Cylinder (Platen)

The clearance between the Type and the Cylinder (Platen) (1) shall be 0.002 ~ 0.006" (0.05 ~ 0.15 mm), when the Type Bar (2) is in firm contact with the Ring (Type Bar Guide) (3).

1) To adjust the clearance, unscrew the 2 screws (5) located on the Frame Rail (6) and move the Slide Base (4) in the direction shown by the arrow.
   Part (7) is the Tapping Plate of the Screw (5).

LEFT SIDE VIEW



4.16 Ribbon Selector and Ribbon Lifter

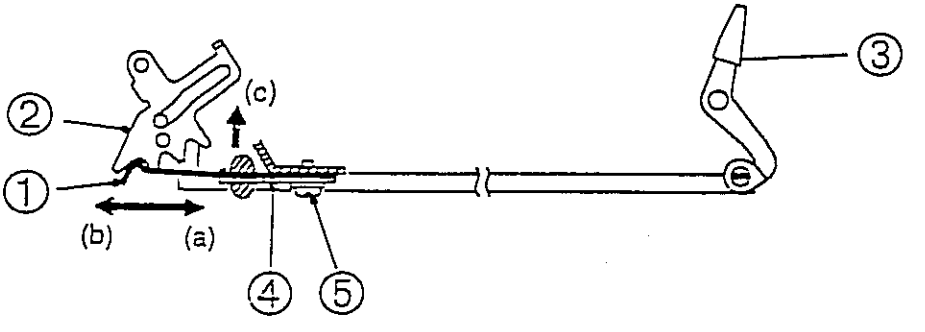
a) **Ribbon Selector**
The Color Selector Detent Spring (1) shall constantly press against the Cam Lever (2). Adjust the pressure in such a way that the Cam Lever (2) does not move when the ribbon lifts, making the operation of the Ribbon Color Selector (3) smooth.
The actual adjustment shall be made pinching Part (c) and shaping the Spring Pad (4).

b) **Ribbon Lifting**
The Color Selector Detent Spring (1) shall be adjusted after unscrewing Screw (5).

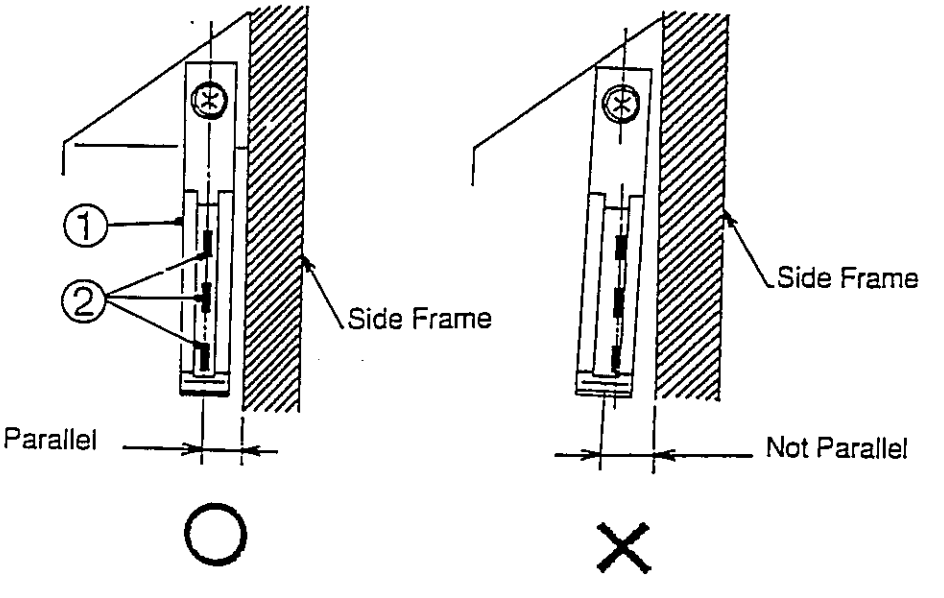
Towards (a) --------- Increases the ribbon lifting
Towards (b) --------- Decreases the ribbon lifting

Note:
The Color Selector Detent Spring (1) must be parallel to the Side Frame.

LEFT SIDE VIEW

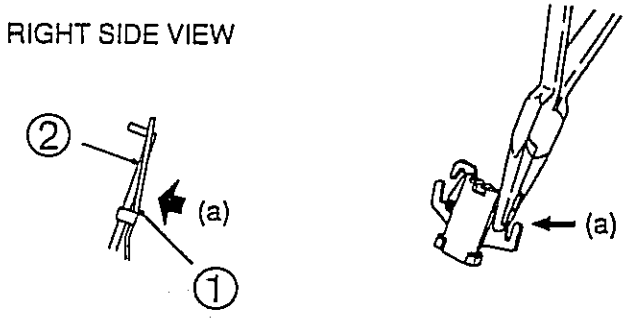


TOP VIEW



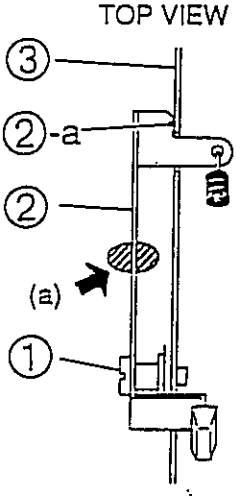
4.17 Ribbon Vibrator

The gap between the Ribbon Vibrator (1) and the Type Bar Guide (2) shall be overlapping. If this gap is large, the paper becomes dirty in contact with the Ribbon.
To adjust this gap, shape the Vibrator Part (a).



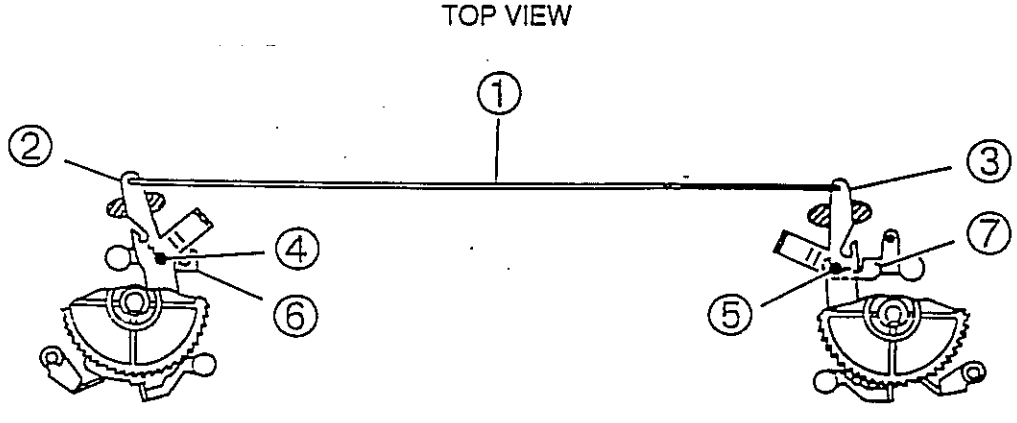
4.18 Touch Control Lever

Unscrew the set Screw (1). To adjust the pressure of the Touch Control Lever (2-a) against the Side Frame (3), shape the Part (a) of the Touch Control Lever (2).



4.19 Ribbon Automatic Winding Reversion (DIN-Type Models Only)

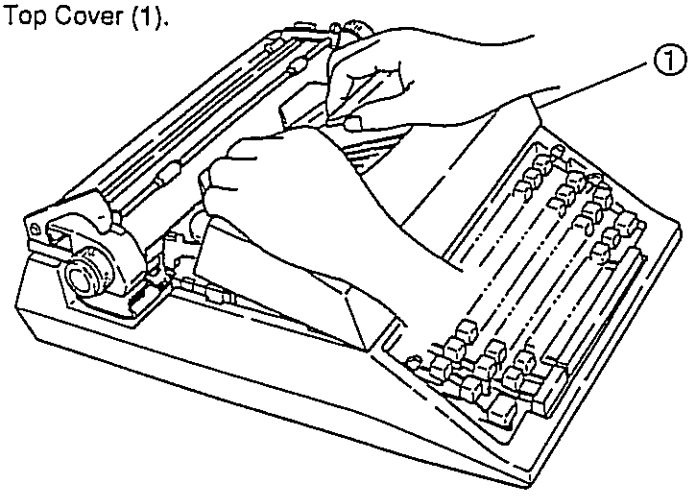
If the Reversing Link (1) is too long or too short, shape the Reversing Lever L (2) and R (3). The Release Lever Pins L (4) and R (5) of the ribbon are locked at the center of the Ribbon Reversing Cam L (6) and (7). When the Reversing Levers L (2) and R (3) are pressed by the Ribbon Eyelet, the shifting of the Reversing Lever shall be smooth.



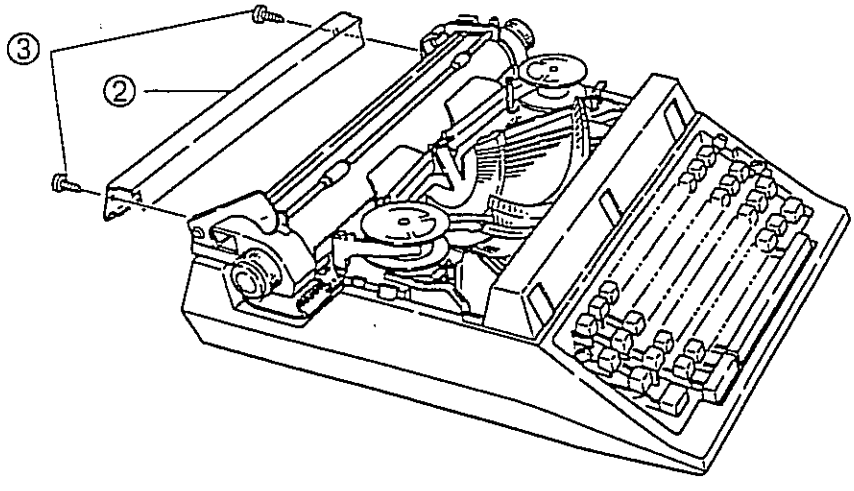
5. ASSEMBLIES REMOVAL

5.1 Housing

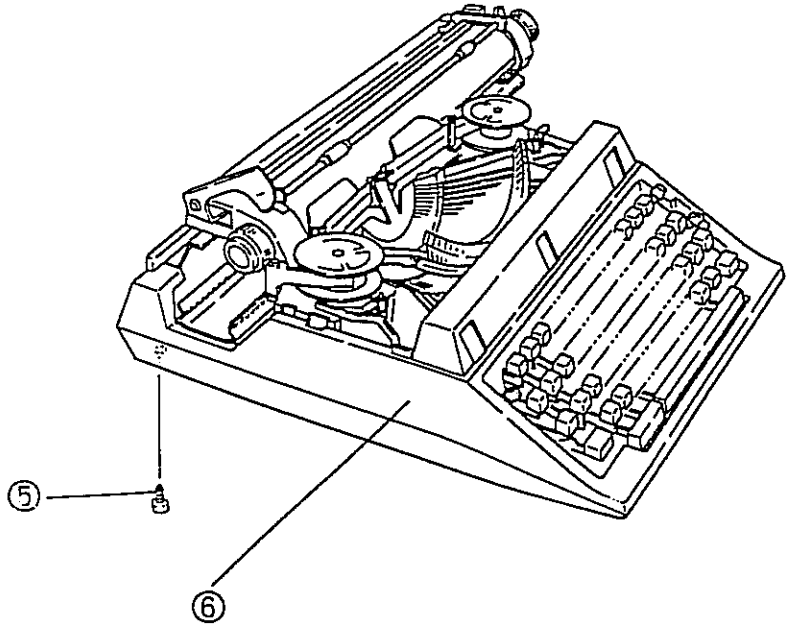
1) Remove the Top Cover (1).



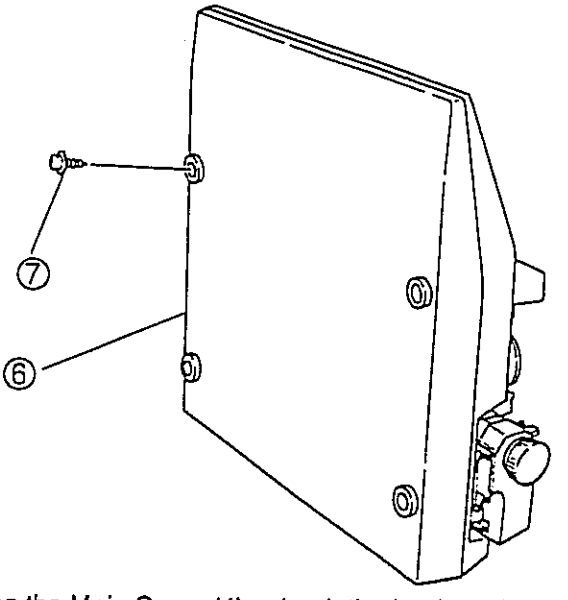
2) Remove the Carriage Back Cover (2) mounting Screws (3).



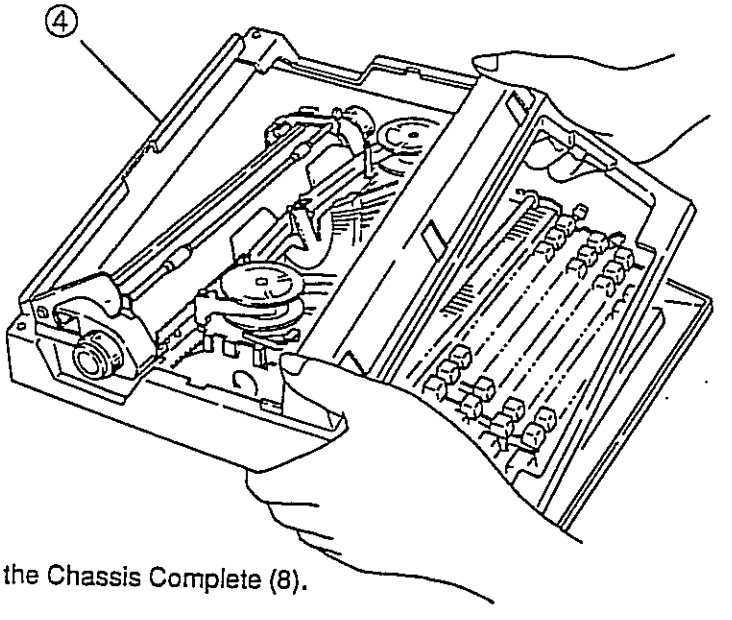
3) Remove the mounting Screws (5) at the Main Cover (4) sides.



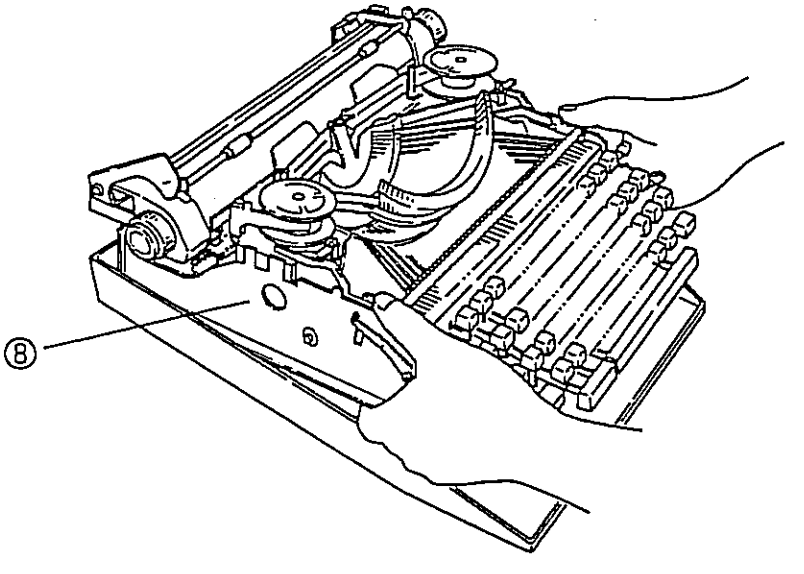
4) Remove the mounting Screws (7) of the Bottom Pan (6).



5) When removing the Main Cover (4) unhook the hooks at both sides.



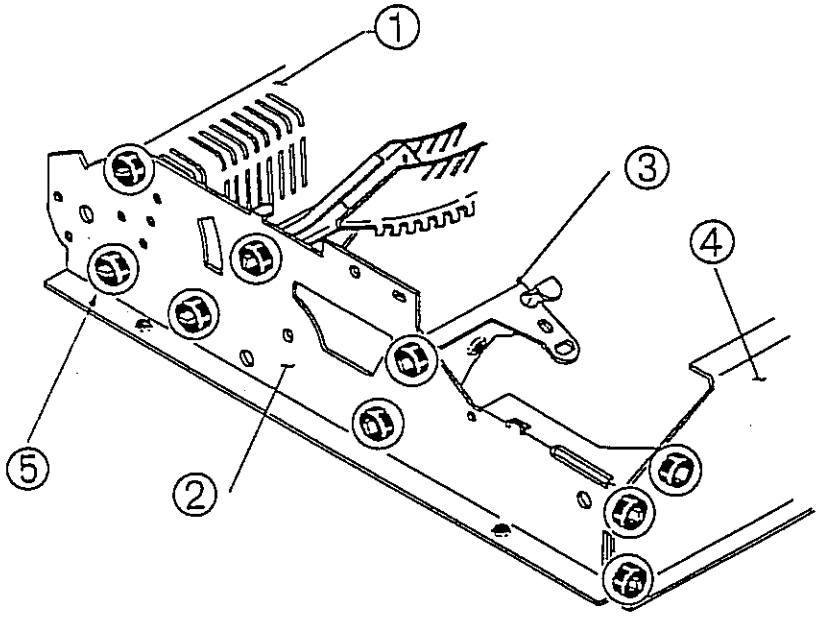
6) Take out the Chassis Complete (8).



5.2 Frame Assembly

The Frame assembly, the Key Lever Holder (1), the Side Frames (R, L) (2), the Slide Bases (R, L) (3) and the Back Frame (4) are assembled together with 18 Nuts (5).

Note:
Do not overhaul the Frame Complete, in other words, do not remove the 18 Nuts (5).



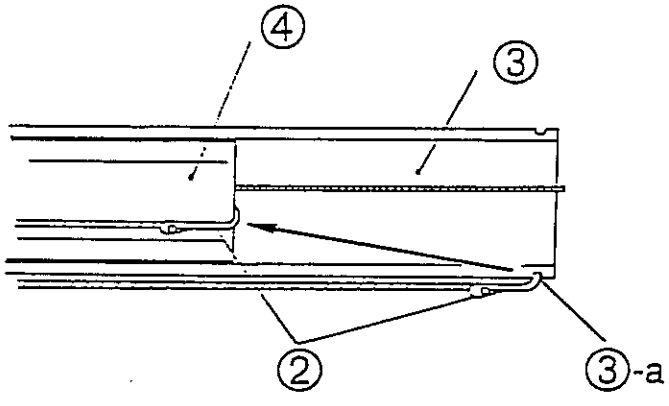
5.3 Carriage Unit

1) Move the Carriage (1) to the right side.
   Remove the Draw Band Hook (2) from the Carriage Rail Large Hole (3-a), and then hook it on the Carriage Base (4).

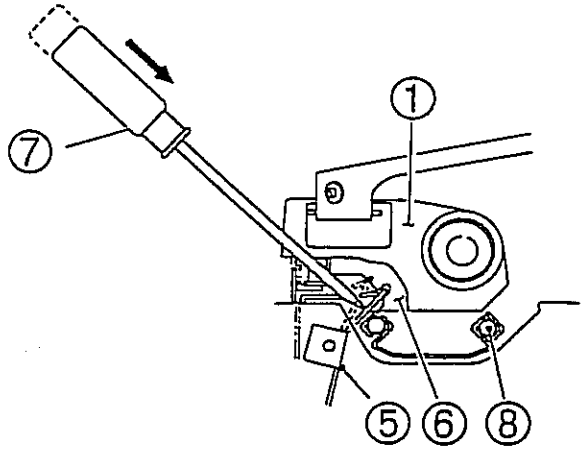
2) Move the Carriage (1) to the right.
   To move the Carriage (1) to the right end, push the Carriage Stopper (5) towards the Escape Hole of the Left Side Plate (6) using the tip of an screwdriver (7), then remove the Carriage (1) from the Left Side Plate (6).
   Press the Carriage Release Button to the "0" position, and move the Carriage (1) upwards, then remove it and the Ball Bearing Complete (8).

Note:
The Draw Band of products to be shipped to Arabian countries (Arabic arrangement) shall be pulled to the right.
Hook up the band at the opposite side of the one shown in the illustration.

BOTTOM VIEW



LEFT SIDE VIEW



5.4 Carriage

1) **Removal of the Carriage Side Covers**
Remove the R (1) and L (2) Platen Knobs.
Remove the screws (3) and (4), and the Carriage Side Covers R (5) and L (6).

2) **Removal of the Paper Bail Scale**
Remove the 2 Springs (7), and the 2 E-Rings (8) mounted on the left and right sides. Then remove the whole Paper Bail Scale (9) from the Side Plates R (10) and L (11).

3) **Removal of the Eraser Table**
Remove the Table Shaft (12) and the Table Spring (13) from the Side Plates R (10) and L (11), and the Eraser Table (14).

4) **Removal of the Platen and Paper Pan**
Release the Line Space Selector (15) (Fig. 5.4-2), the Paper Releasing Lever (16) and the Platen (7) from the Carriage, then remove the Paper Pan (18).

5) **Removal of the Feeding Roller**
After removing the Paper Pan (18), remove the E-Rings (19), then dismount the Feeder Roller Right and Left Metals (20, 21) from the Paper Pan together with the Front and Rear Paper Feeder Rollers (22, 23).

6) **Removal of the Carriage Rack**
First, set a margin at the central position and slide the Carriage up to this margin. Remove the Side Screws (26) and after the Carriage Releasing Lever Complete (24) and the Spring (25). Remove the Rack Setting Screws (R, L) (27) from the Side Plates R (10) and L (11), and then extract the Carriage Rack (28) from the Carriage Rail (29).

7) **Removal of the Paper Release Lever**
Remove the Springs (30, 31) from the Paper Releasing Lever (16), and the L-Shaft Arm Complete (32) from the Carriage Side Plate (10) R hole.

8) **Removal of the Margin Rack and Paper Support Plate**
First remove the 2 Screws (34) and then the Tab Stop Rack (33).
Remove the Margin 2 Rack Setting Nuts (35). Dismount the R Side Plate (10) from the Paper Support Plate (36), after removing the 2 mounting Screws (37). Dismount the Paper Support Plate (36) and the Margin Rack (38) from the L Side Plate (11). Remove the Margin Stop Complete (39) from the Margin Rack (38).

9) **Removal of the Paper Support Arm**
First extract the Screw (41), the Wave Washer (42) and then the Paper Support Arm (40).

10) **Removal of the Return Handle**
Remove the Nut (44) and extract the Steel Ball (43).
First, dismount the Handle Bracket Lever Mounting Screw (46), the Washer (47), and the Handle Plate Spring (48), then remove the Return Handle (45).
To dismount the Handle Bracket (49), first remove the Mounting Screw (50) and the Nut (51).

Note:
The movement of the return handles of the typewriters to be shipped to Arabian countries (Arabic arrangement), have been changed according to the line space crank and the connection link assembly.
Remove the connection link assembly from the line space crank and handle bracket.
After removing the E-ring, take the line spacing crank off the handle bracket.
Also, take off the spacer located between the L side plate and the handle bracket.

11) **Removal of the Line Spacer**
To remove the Line Spacer Link (55), first remove the E-Ring (54), then the Spring (52) and the Line Spacer Feed Arm Complete (53).

12) **Removal of the Line Spacer Detent Arm**
Remove the E-Ring (56) then, the Detent Arm Complete (57), the Detent Spring (58) and the Detent Arm (59).

Figure 5.4-1

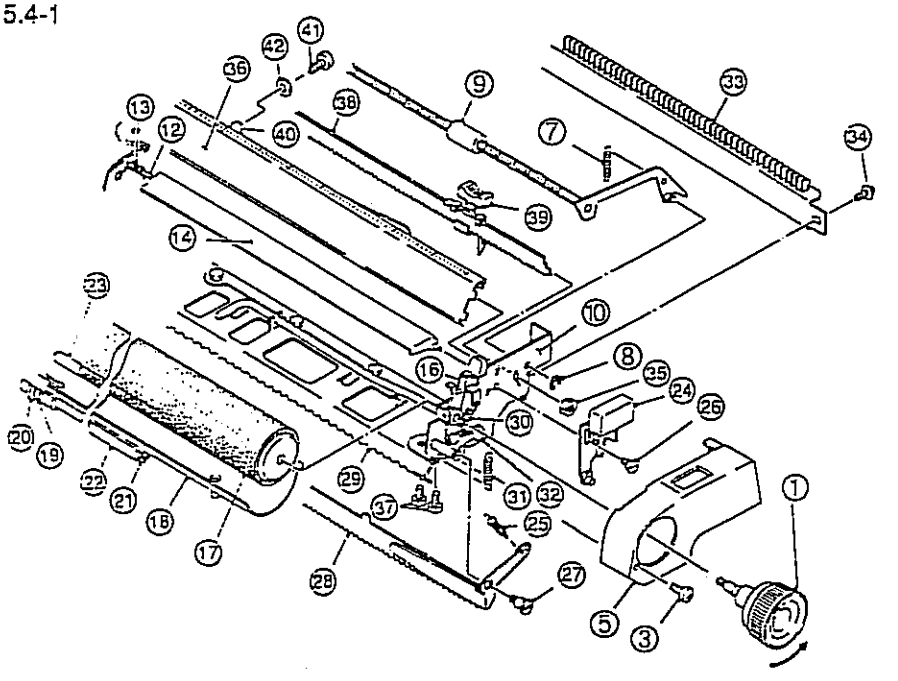
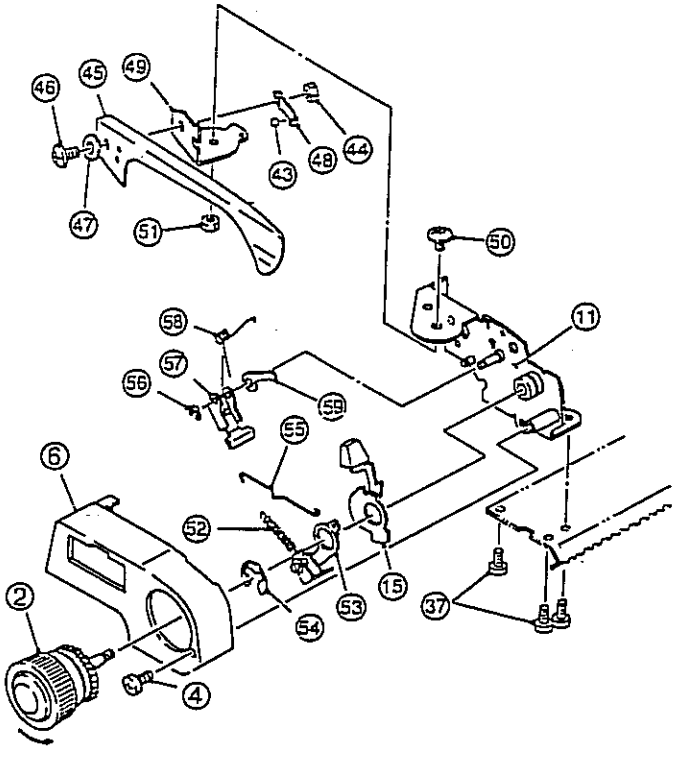


Figure 5.4-2



* The illustration shows the arrangement of the products bound for Arabian countries.

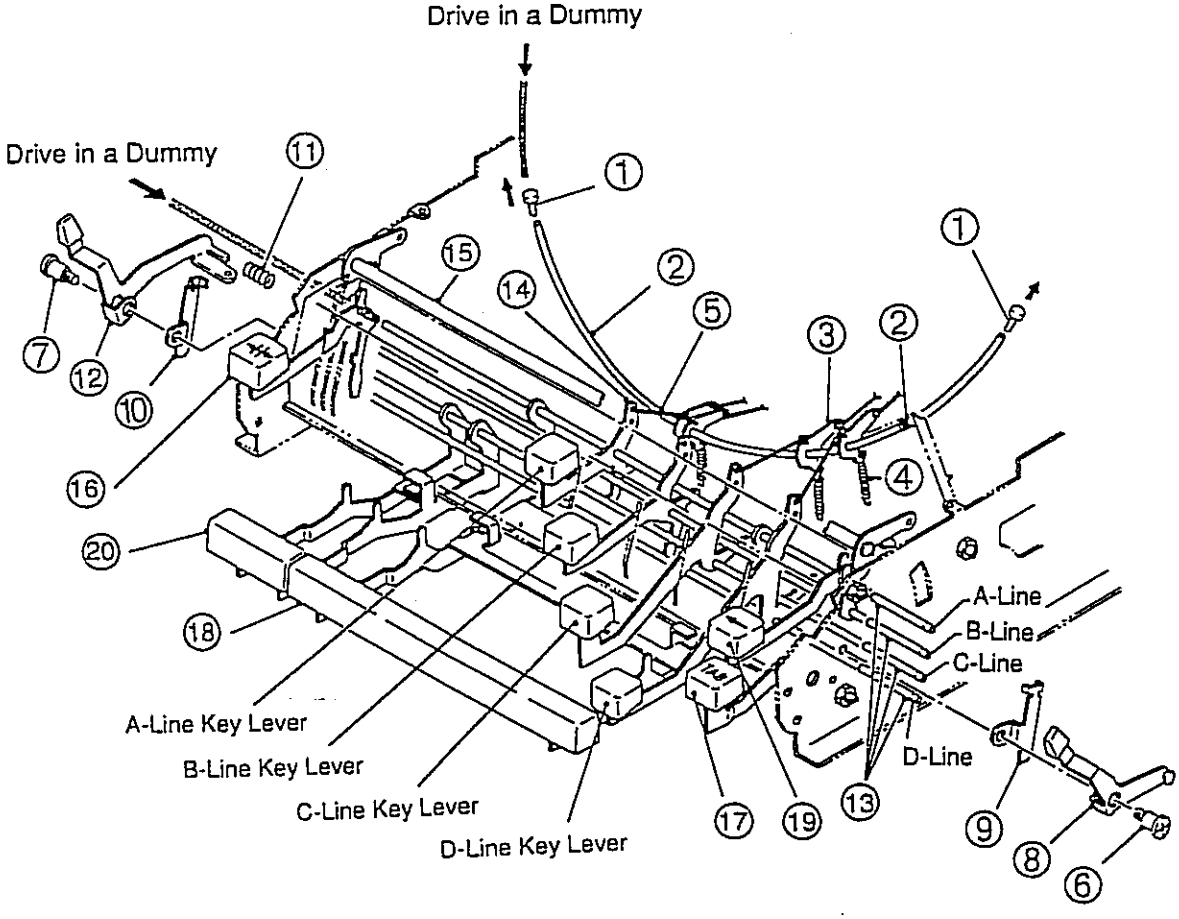
5.5 Key Lever/Sub-Lever

1) **Removal of the Sub Lever**
Remove the Fulcrum Shaft Stoppers (1), then push out the Type Bar Fulcrum Shaft (2) using a Dummy. Remove the Sub Lever (3) and the Sub Lever Spring (4).

Note:
When remounting the Sub Lever (3) pay attention to follow the correct mounting sequence.

2) **Removal of the Key Lever**
Remove the Key Lever Link (5), the Set Screws (6) and (7), and then the Tab Set/Clear Lever (8), the Fulcrum Wire Stoppers R (9) and L (10), the Spring (11) and the Touch Control Lever (12).
The Key Lever Fulcrum Shafts (13) shall be driven out using a Dummy, in order to remove the Key Lever (14).

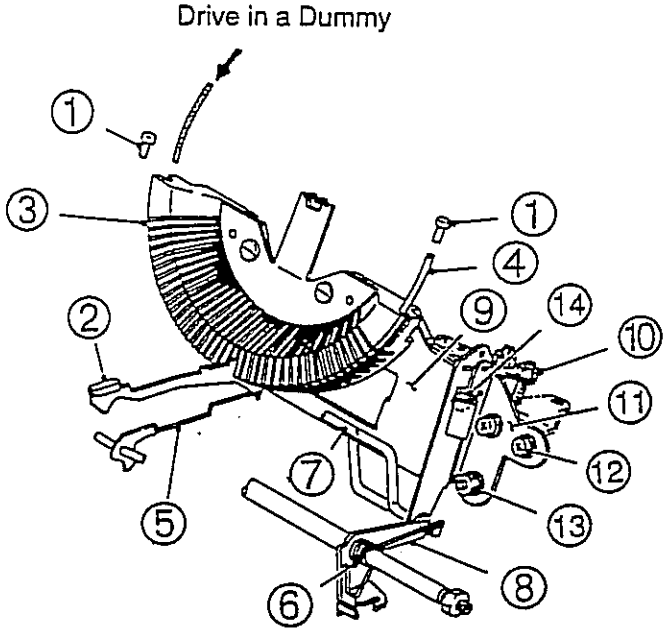
Removal of:
Ribbon Universal Bar (15) ---------- B-Line Fulcrum Shaft
Margin Releasing Key Lever (16) ---------- A-Line Fulcrum Shaft
Tab Key Lever (17) ---------- B-Line Fulcrum Shaft
Space Bar (18) and Back Space Key Lever (19) ------ A-Line Fulcrum Shaft
Automatic Space Repetition Key Lever (20) ---------- C-Line Fulcrum Shaft



5.6 Type Bar and Segment Complete

1) **Removal of the Type Bar**
Remove the 2 Fulcrum Shaft Stoppers (1).
Extract the Type Bar (2) from the Segment (3) after driving out the Type Bar Fulcrum Shaft (4) using a Dummy, then remove the Type Bar Link (5).

2) **Removal of the Segment Complete**
Remove the Shifting Arm Springs (R, L) (6) from the Segment Base Hanger Shaft (7).
Extract this last one from the Shifting Arms (R, L) (8) and the Segment Base (9) sliding it to the right or to the left.
Remove the shift Upper Stoppers (R, L) (10), the Slide Guide (11) to the right after unscrewing the 2 Screws (12) and the Nut (13), then extract the Steel Balls (14) from the right and left side.
Take out the Segment Complete (15).



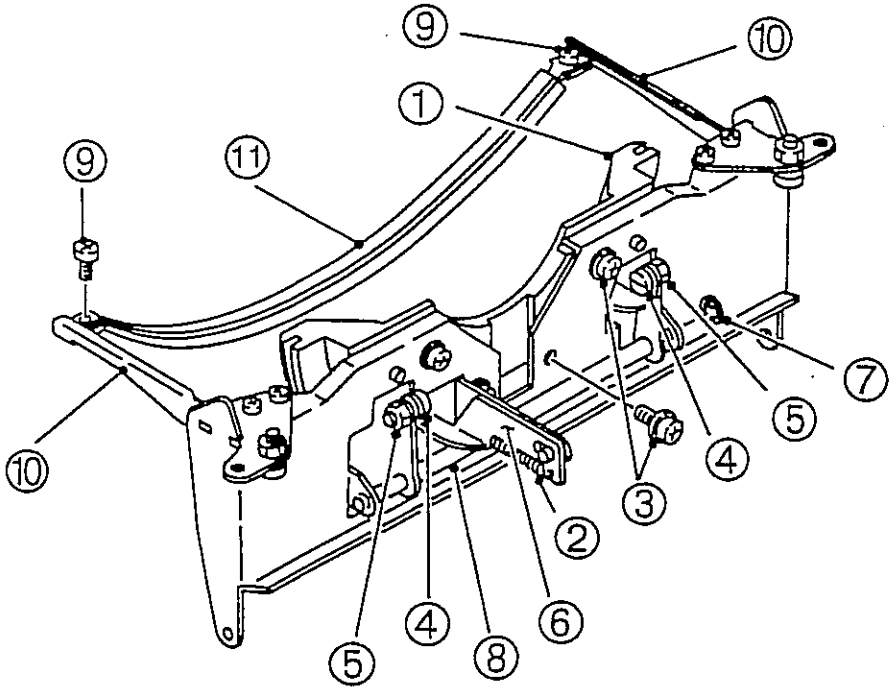
5.7 Segment/Segment Universal

1) **Removal of the Segment**
Remove the Spring (2), the 4 Screws (3) and then remove the Segment (1).

2) **Removal of the Segment Universal**
Unscrew the 2 Screws (4) and the 2 Nuts (5), after removing the Segment (1), then extract the Segment Universal (6).

3) **Removal of the Universal Crank Complete**
Remove the E-Ring (7) and then take out the Universal Crank Complete (8).

4) **Removal of the Type Bar Reset**
Extract the Screws (9) of the Type Bar Reset Support (R, L) (10), after removing the Type Bar Reset (11).

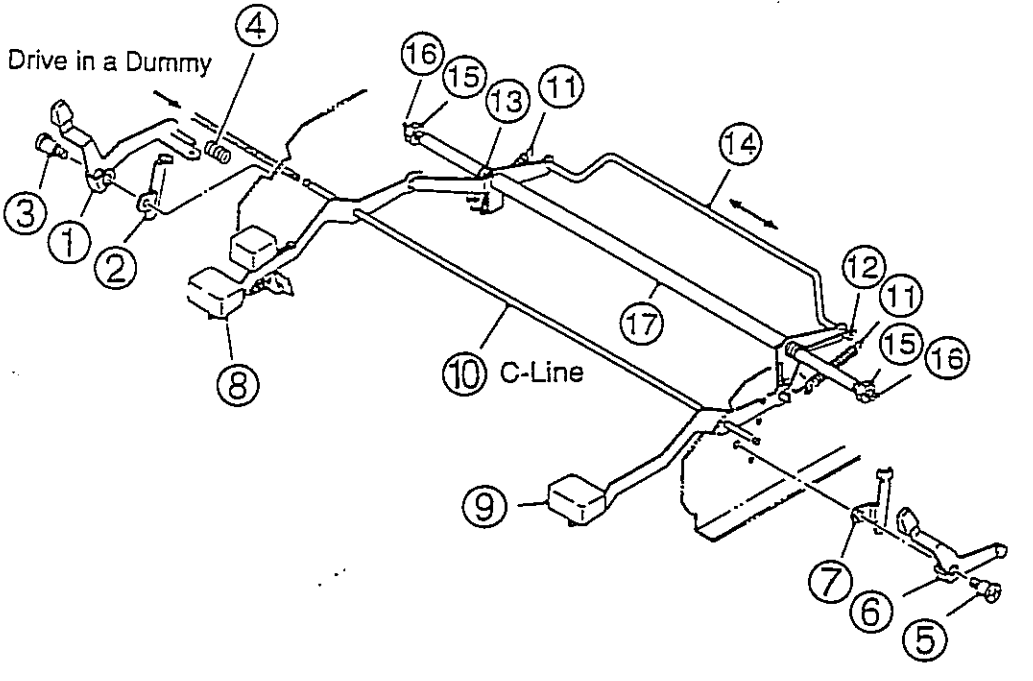


5.8 Shift Unit

1) **Removal of the Touch Control**
After removing the Lever Set Screw L (3) and the Spring (4), remove the Touch Control Lever (1) and the Wire Stopper L (2).

2) **Removal of the Shift Key Lever**
First, remove the Lever Mounting Screw R (5), then Tab Set/Clear Lever (6), and the Wire Stopper R (7). After removing the Key Lever Fulcrum Shaft (10) of the C-Line, drive out the Shift Key Levers L (8) and R (9) using a Dummy.

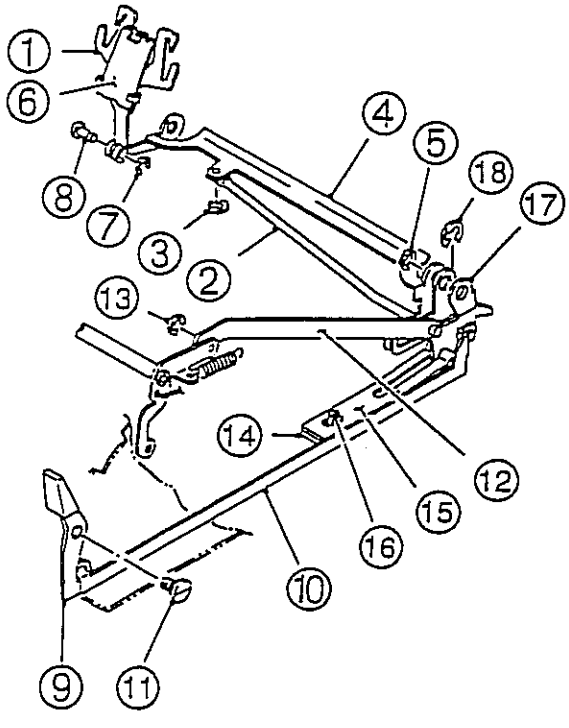
3) **Removal of the Shift Torsion Bar**
Remove the 2 Segment Lifting Springs (11), then the Shift Arm Springs R (12) and L (13) from the Segment Base Hanger Shaft (14).
Unscrew the Nuts (15) of either side and the Shift Center (16), next, remove the Shift Torsion Bar (17) sliding the Segment Hunger Shaft (14) to the left or to the right.



5.9 Color Selector

1) **Removal of the Ribbon Vibrator**
   To start the disassembling first lock the shift.
   Remove the Ribbon Tape from the Vibrator (1).
   Remove the E-Ring (3) and then the Ribbon Lifting Bar (2).
   Remove the E-Ring (5) and after the Ribbon Lifting Crank (4).
   Dismount the Vibrator (1) from the Type Bar Guide (6) and then extract it from the typewriter.
   Take out the Vibrator (1) after extracting the E-Ring (7) and the Set Pin (8).

2) **Removal of the Color Selector**
   Take out the Ribbon Selector (9) and the Link Selector (10) after removing the Lever Mounting Screw (11). Take out the Lifting Link (12) after removing the E-Ring (13). then, remove the screw (16) to take out the Spring Pad (14) and the Detent Spring (15).
   Remove the E-Ring (18) and take out the Cam Lever (17).

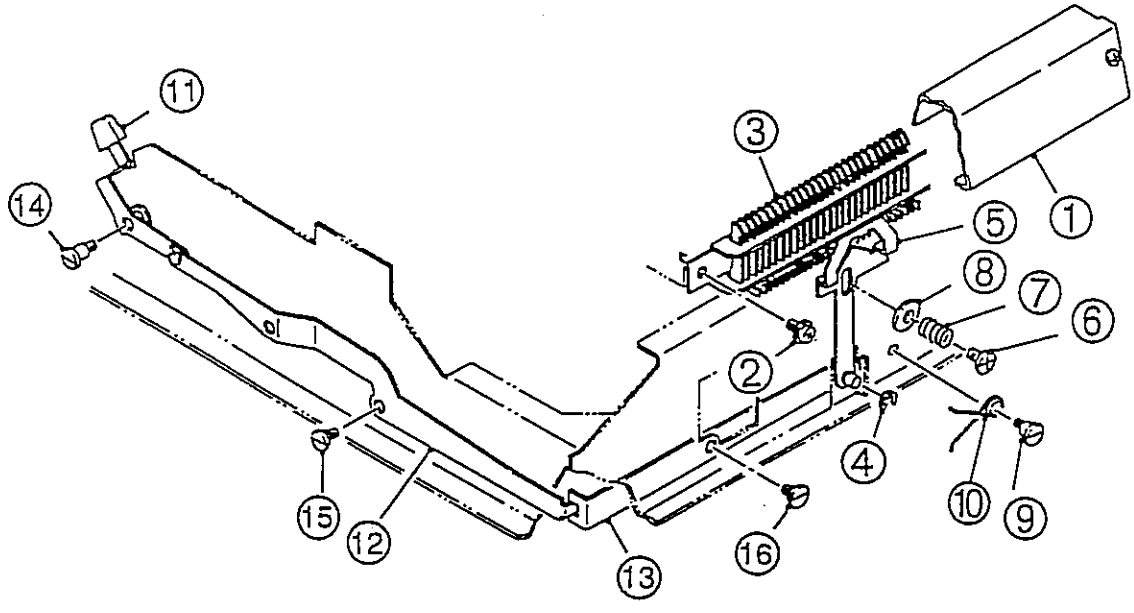


5.10 Tabulator Set/Clear Unit

1) Remove the Back Cover (1).
   Take out the left and right screws (2) from the Tab Rack (3).

2) **Removal of the Tab Set/Clear Finger**
   Take out the E-ring (4). Remove the Lever Set Screw (6), the Spring (7) and the Washer (8) to dismount the Tab Set/Clear Finger (5). Then, extract the Spring Mounting Screw (9) and the Natural Guide Spring (10).

3) **Removal of the Tab Set Lever**
   First unscrew the Lever Set Screws (14, 15 and 16), then extract the Tab Stop Set Levers I (11), II (12) and III (13).



5.11 Escapement Base Complete

1) Remove the Carriage Unit.

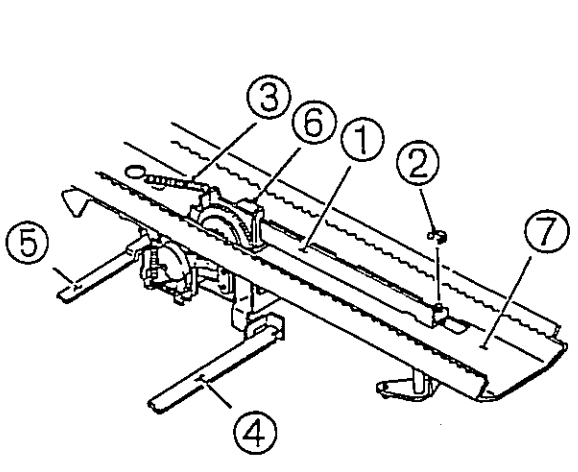
2) Remove the E-Ring (2) and the Spring (3) to take out the Back Space Pawl (1).

3) Extract the Space Bar Link (4) in the direction indicated by (c).

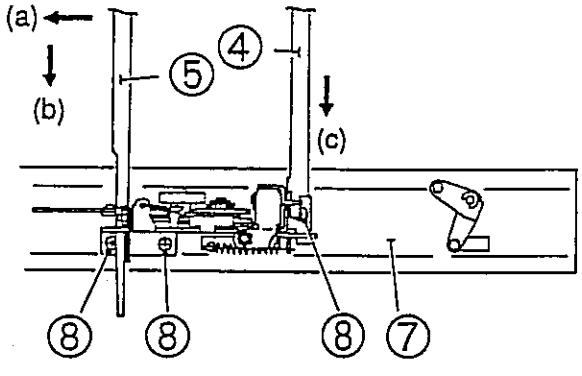
4) The Space Repetition Link (5) shall be extracted in the direction shown by the arrow. (First towards (a) and then towards (b).)

5) To remove the Escapement Base Complete (6), unscrew the 3 Screws (8) from the Carriage Base (7)

Note:
The escapement base assembly of typewriters destined to Arabian countries (Arabic arrangement), is different from the one illustrated here.



BOTTOM VIEW



5.12 Back Frame

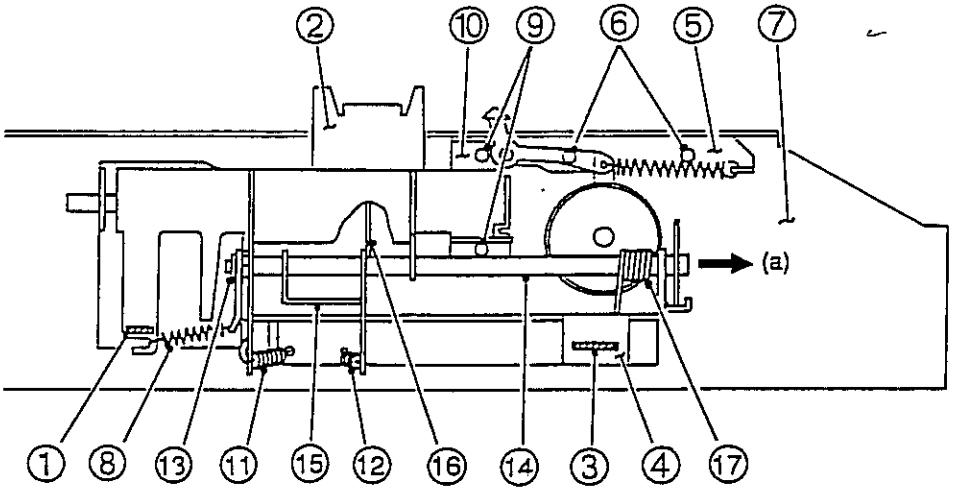
1) **Removal of the Tabulator and Margin Links**
Push the Carriage Stopper (2) to extract the Margin Link (1). Push the Tabulator Main Bar (4) to extract the Tabulator Link (3).

2) **Removal of the Bell Complete**
First, unscrew the 2 Screws (6) from the Back Frame (7) and then remove the Bell Complete (5).

3) **Removal of the Carriage Stopper**
Remove the Bell Complete.
Remove the Spring (8).
Remove the 2 Screws (9) from the Back Frame (6).
Remove the Stopper Bracket Complete (10) from the Back Frame (6).
Remove the Carriage Stopper (2).

4) **Removal of the Stopper Lifting Crank Complete**
Remove the Spring (11), and (12).
Remove the E-Ring (13) and then extract the Main Bar Shift (14) from the Back Frame (6) in the direction indicated by (a).
To remove the Tabulator Main Bar (4), remove the Stopper Lifting Crank Complete (15) and (16), and the Main Bar Spring (17).

REAR VIEW

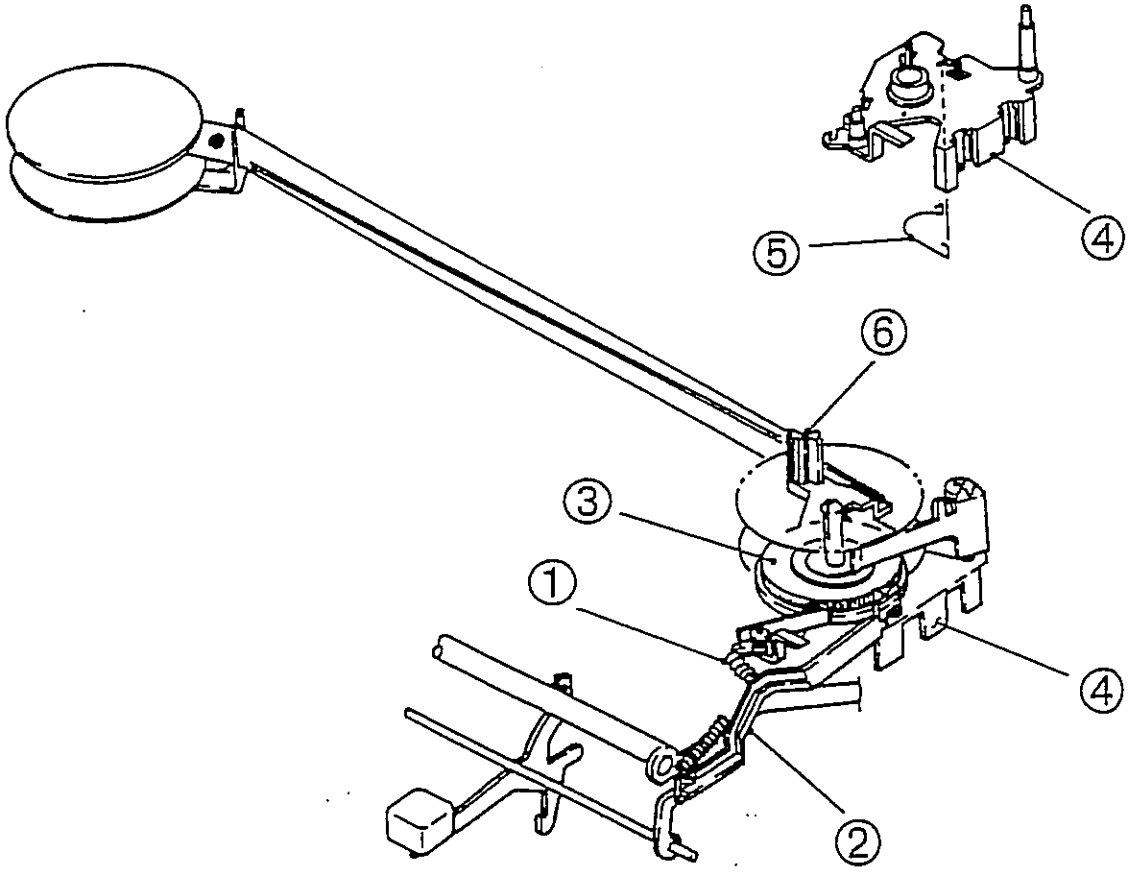


5.13 Ribbon Feeder

Original Ribbon Feeder

1) Remove the Springs (1) from the R and L Ribbon Feeder Arms (2), and then remove the R and L Ribbon Feeder Arms (2).

2) Extract the R and L Ribbon Feeder Gears (3) from the R and L Ribbon Bases (4) Remove the R and L Reversing Springs (5) from the R and L Ribbon Bases (4), and then take out the R and L Ribbon Arms (6).

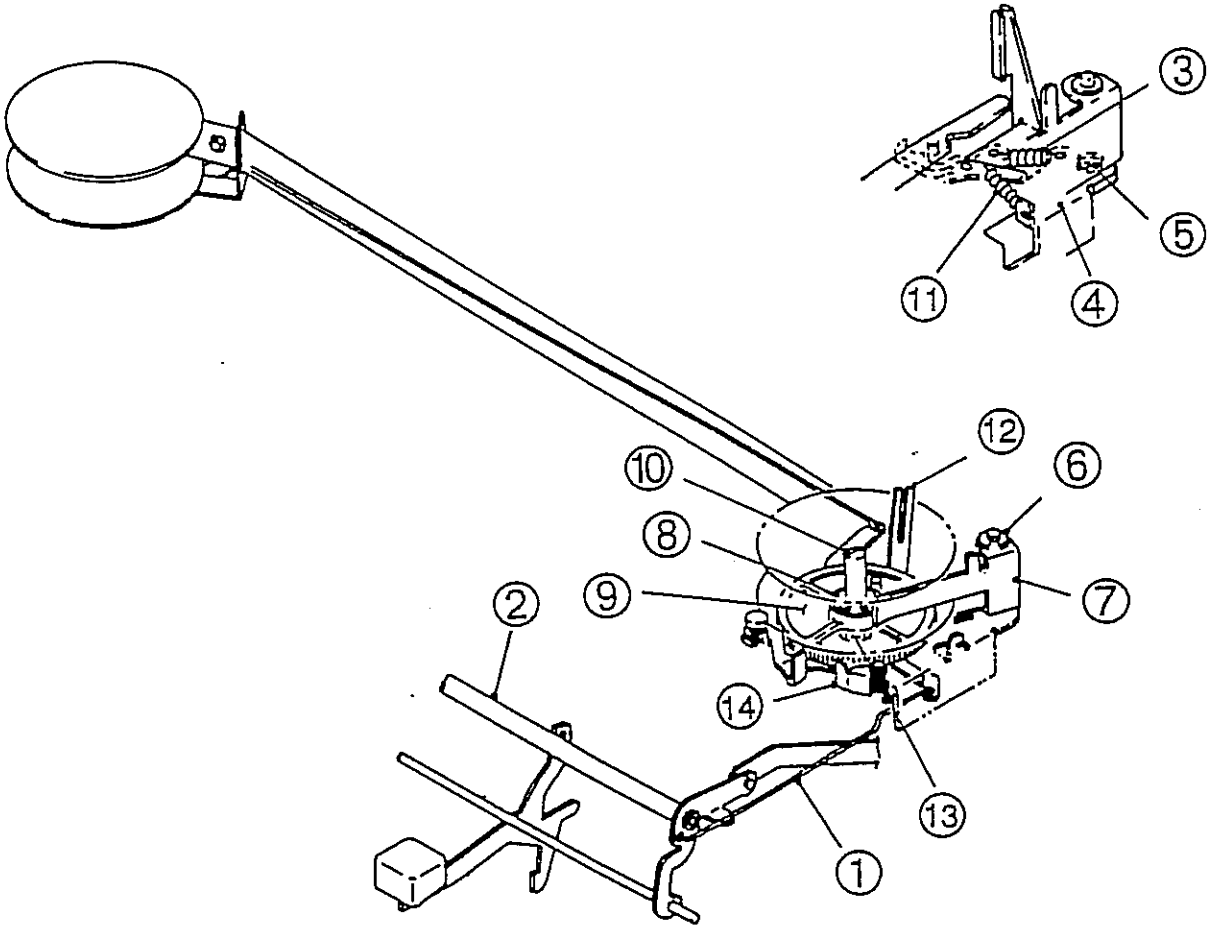


DIN-Type Ribbon Feeder

1) Remove the R and L Ribbon Feed Links (1) from the Universal Bar (2).

2) Remove the Reversing Springs (3) from the Ribbon Bases (4) R and L.
Extract the Ribbon Holding Arm Springs (5) from the R and L Ribbon Base (4).

3) Remove the E-Rings (6) and then extract the R and L Ribbon Holding Arms (7).
Remove the E-Rings (8) an the extract the Ribbon Ratchet Gears (9) from the Ribbon Spool Pins (10).
Extract the Springs (11) from the R and L Ribbon Base (4), and the R and L Ribbon Arms (12) from the Ribbon Spool Pins (10).
Remove the Nuts (13) and then the Ribbon Feed Pawl Levers (14) and the Lever Metals.



6. LUBRICATION AND CLEANING

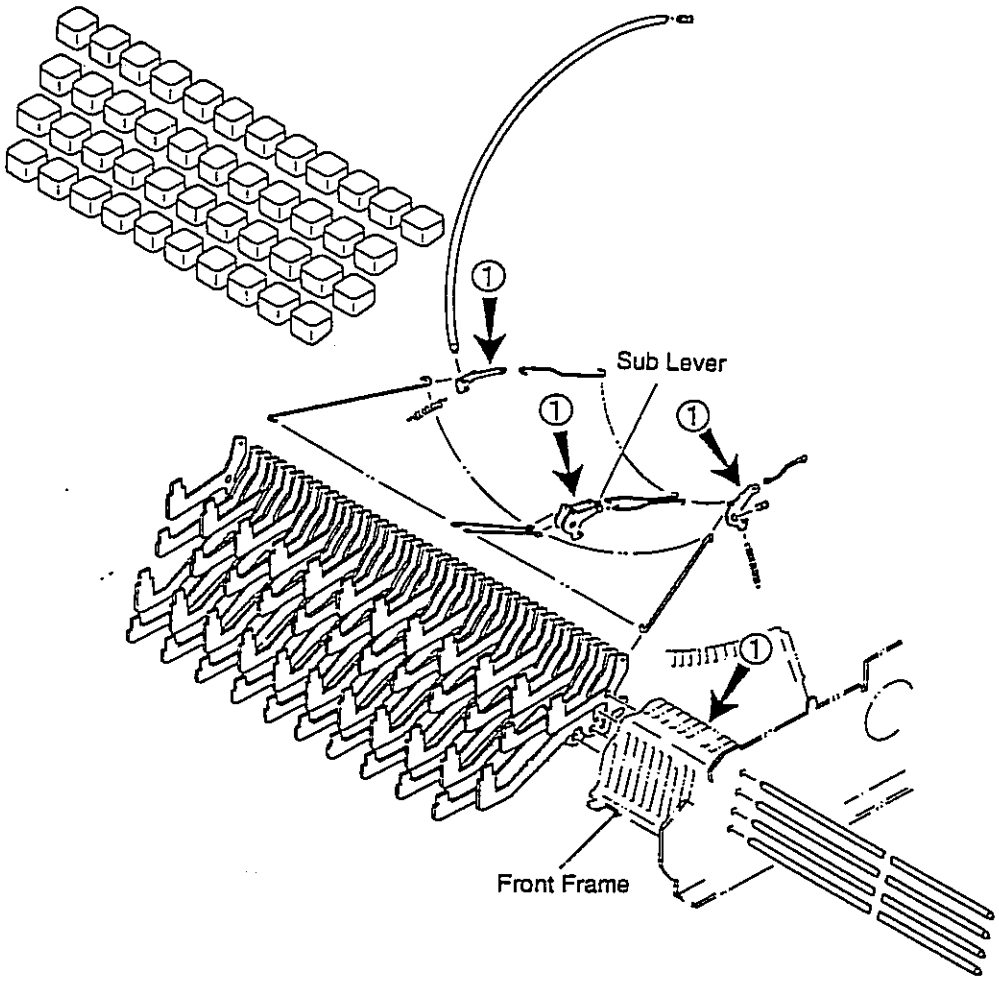
6.1 Lubrication

The following pages show the main lubrication points. The proper lubrication is essential to ensure many years of trouble free service and prevent malfunctioning.
The numbers inside the circles, indicate the type of lubricant used and the arrow indicates the lubrication point.

List of Lubricants:

1) Shell Turbine Oil #32
2) Universal Grease #0
3) 1) and 2) mixed 3:1
4) Dow Corning's Molykote EM-60

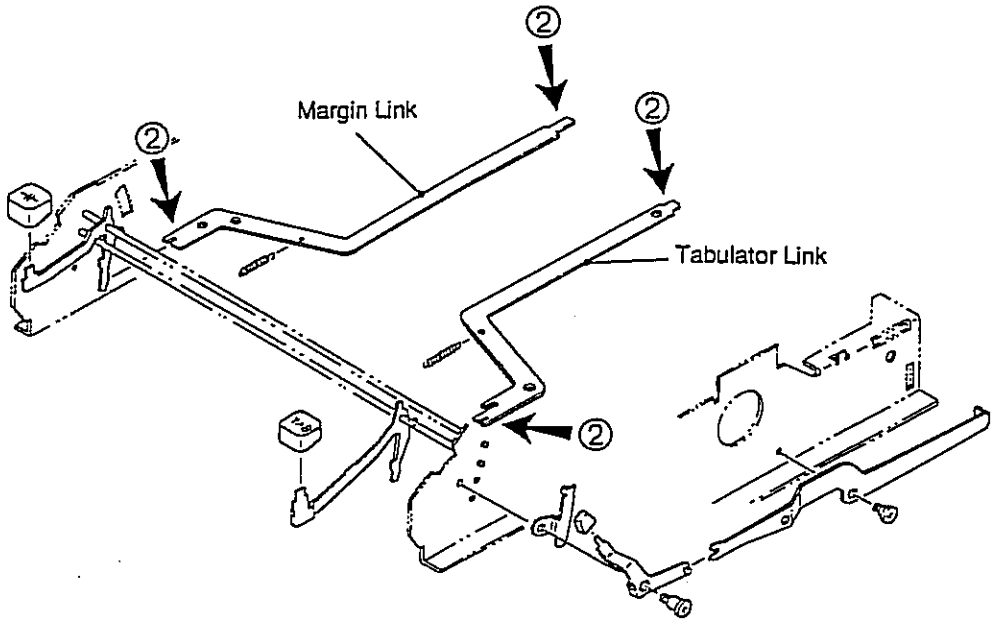
KEY MECHANISM



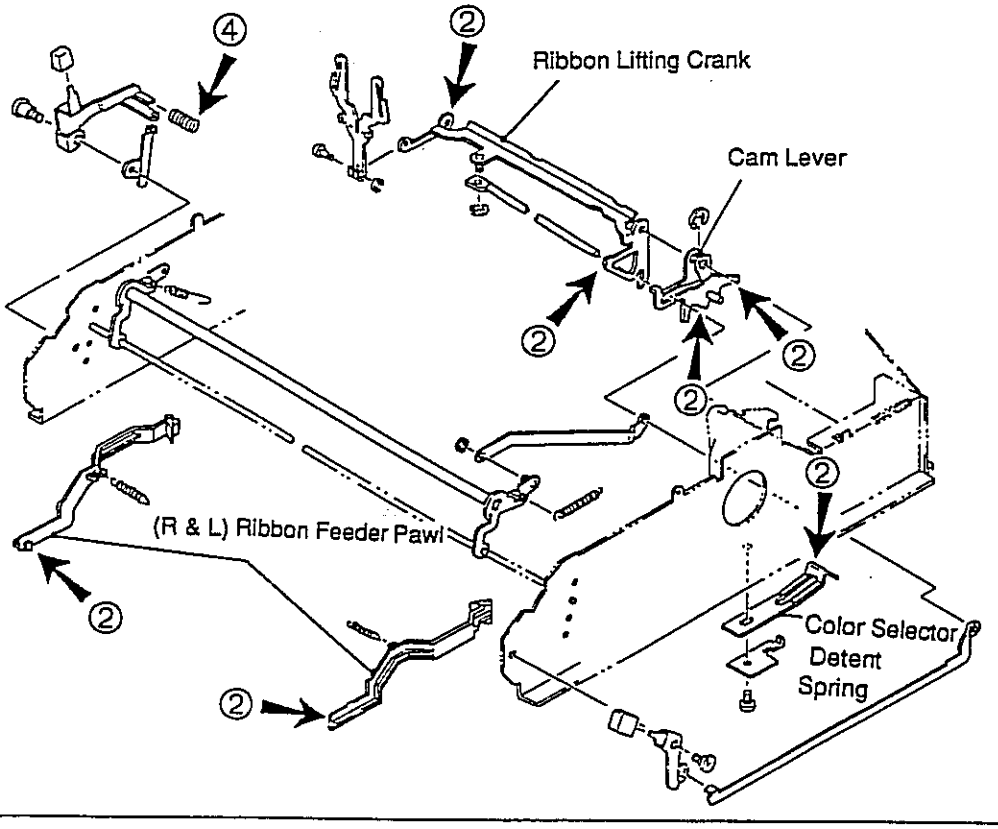
List of Lubricants:

1) Shell Turbine Oil #32
2) Universal Grease #0
3) 1) and 2) mixed 3:1
4) Dow Corning's Molykote EM-60

TABULATOR/MARGIN MECHANISM



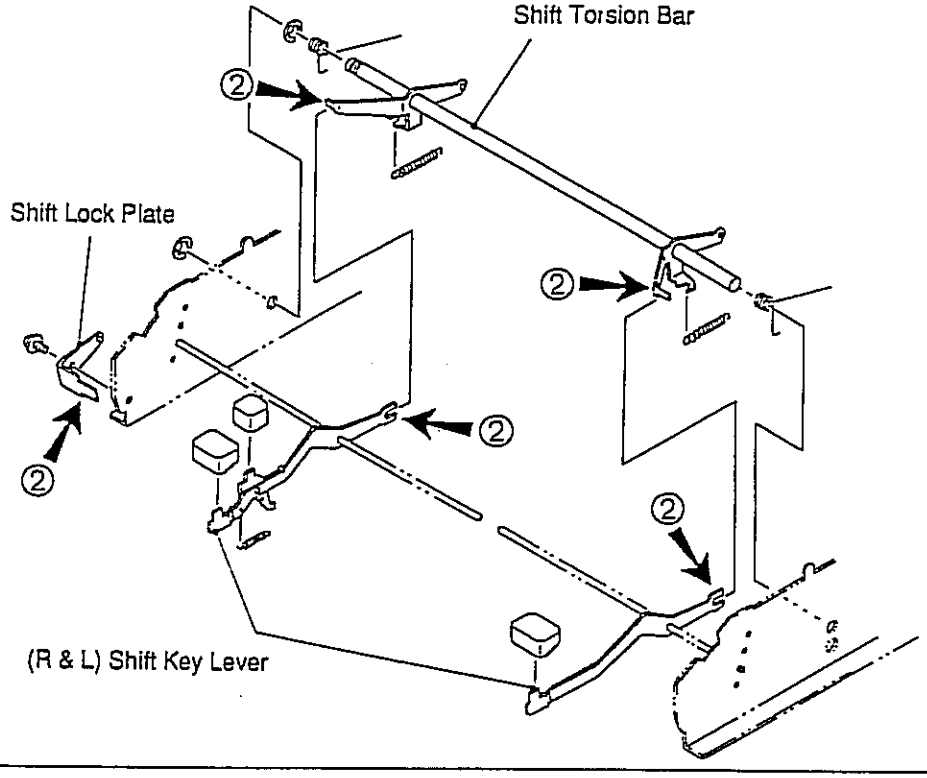
RIBBON LIFTING MECHANISM



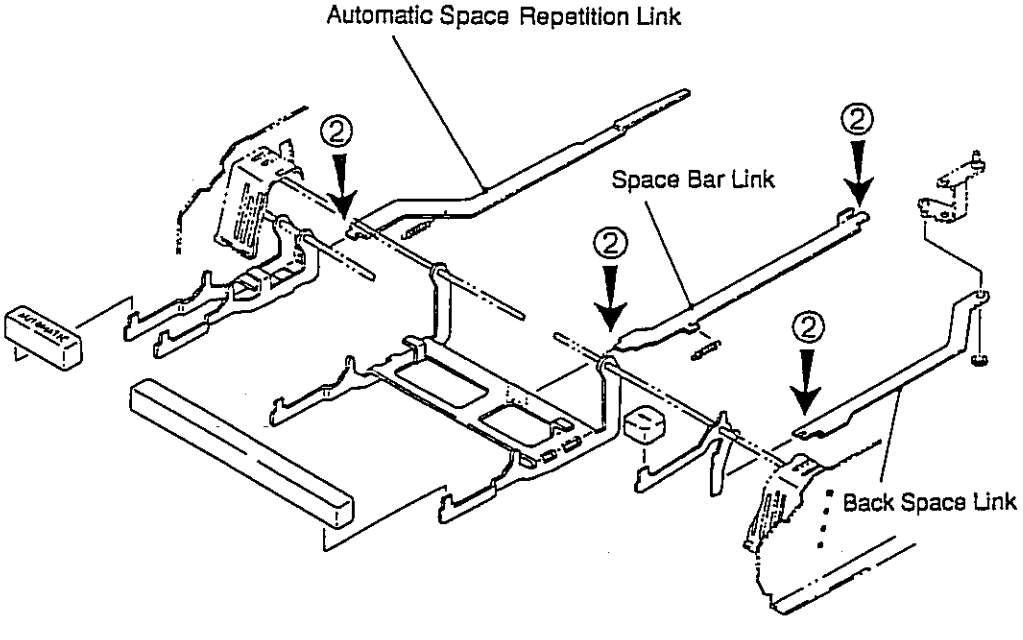
List of Lubricants:

1) Shell Turbine Oil #32
2) Universal Grease #0
3) 1) and 2) mixed 3:1
4) Dow Corning's Molykote EM-60

SHIFTING MECHANISM



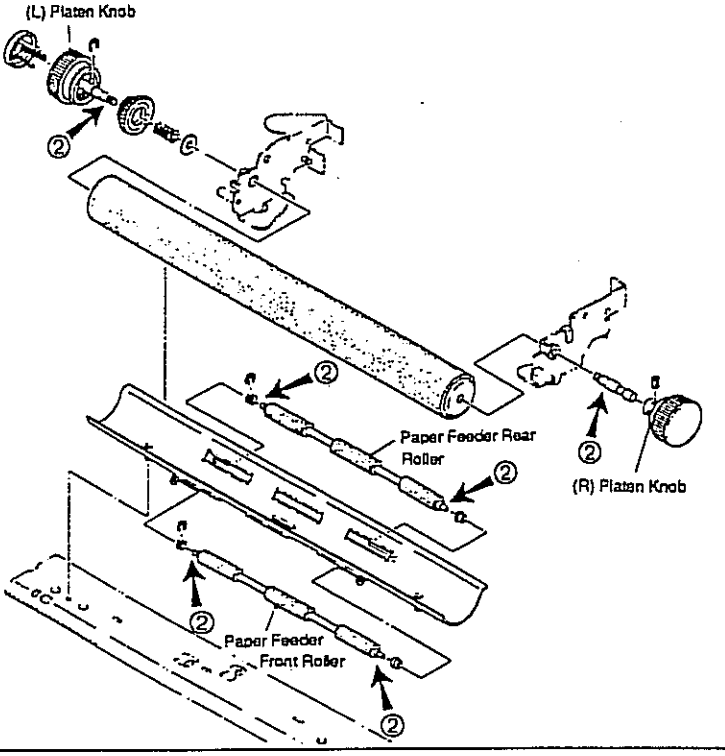
SPACE & BACK SPACE MECHANISM



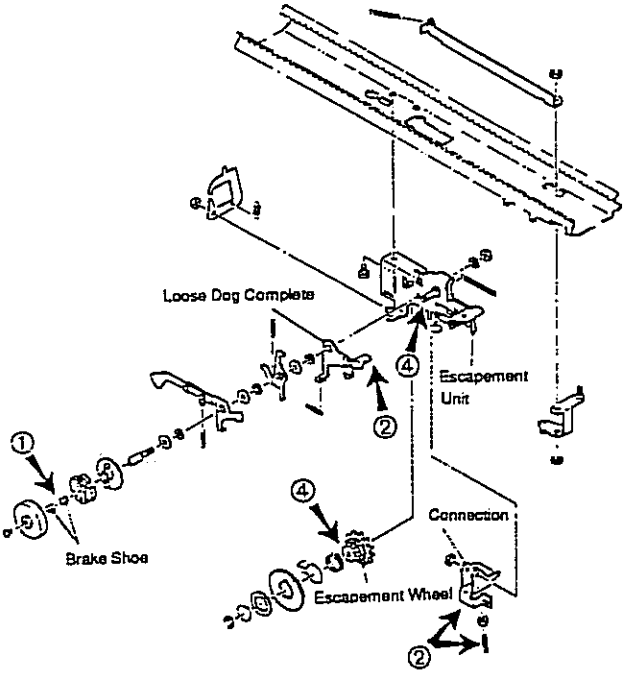
List of Lubricants:

1) Shell Turbine Oil #32
2) Universal Grease #0
3) 1) and 2) mixed 3:1
4) Dow Corning's Molykote EM-60

PLATEN MECHANISM



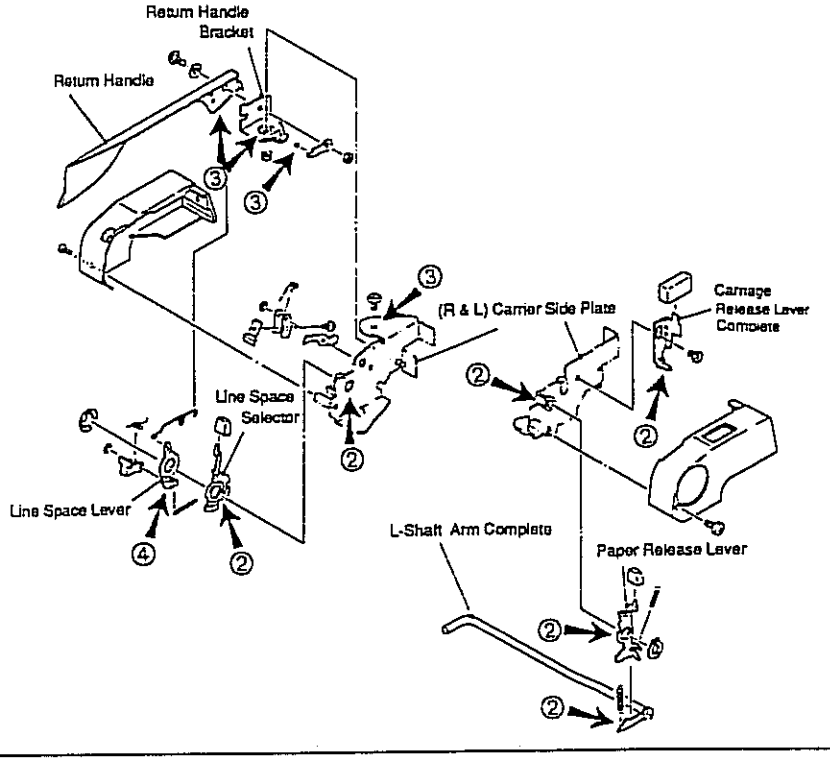
ESCAPEMENT MECHANISM



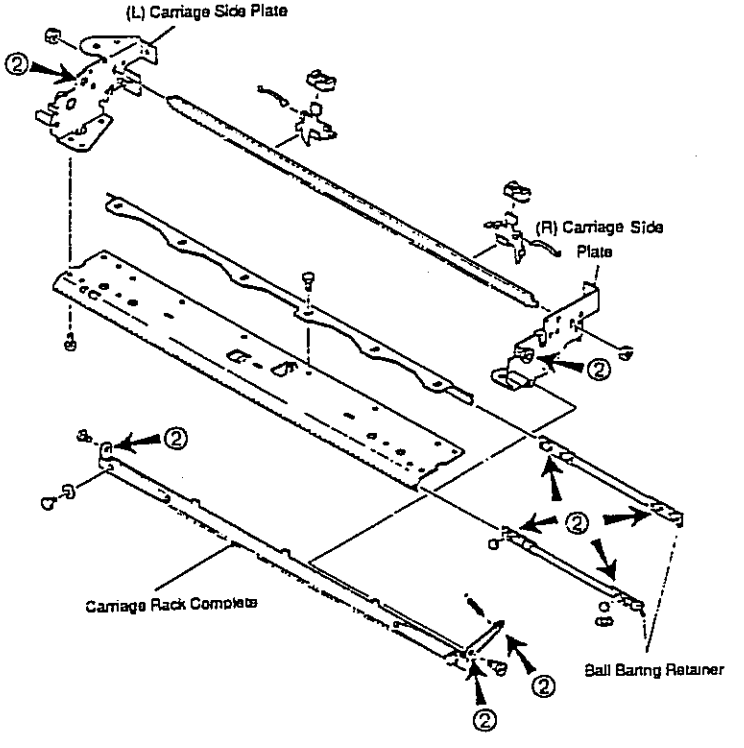
List of Lubricants:

1) Shell Turbine Oil #32
2) Universal Grease #0
3) 1) and 2) mixed 3:1
4) Dow Corning's Molykote EM-60

CARRIAGE LATERAL MECHANISM



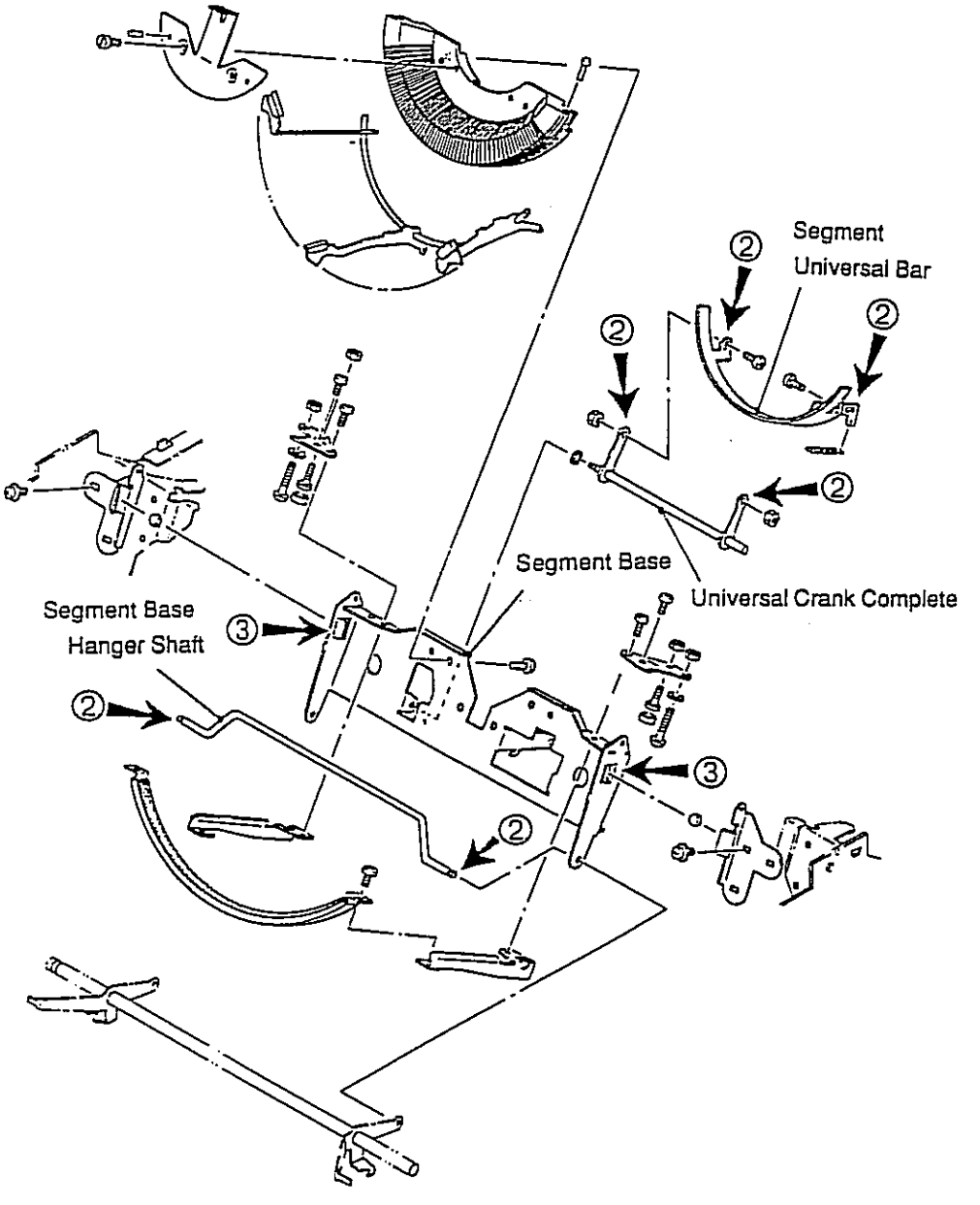
CARRIAGE BASE MECHANISM



List of Lubricants:

1) Shell Turbine Oil #32
2) Universal Grease #0
3) 1) and 2) mixed 3:1
4) Dow Corning's Molykote EM-60

SEGMENT MECHANISM



6.2 Cleaning

Clean the typewriter according with the following procedure:

Note:

- Do not use Thinner or other Organic Solutions.
- Be careful not to Drop Pins or Clips into the Typewriter.
- Clean the inside of the Typewriter with a clean, Dry Cloth.
- When using a cleaning agent, be careful not to drop it inside the Typewriter.
- To clean the Typewriter we recommend that your remove the following parts from it:

1) **Platen and Bail Rollers:**
   Remove the Platen and the Bail Rollers, (see the Carriage Unit Section). Moisten a clean cloth with alcohol and wipe the dirt, dust and ink off the Platen or Bail Roller surface. Do not use the Typewriter until the Platen and the Bail Roller Units have dried up.

2) **Key Tops and Key Levers:**
   Wipe the Key Tops (see the Key Lever Unit Section), using a cloth moistened with Alcohol. Do not use the Typewriter until the Key Tops have dried up. Clean the Key Lever Comb Slots carefully, using a dry cloth.

3) **Housing:**
   Remove the Main Cover (see Housing/Chassis Assembly Section), and clean using a cloth moistened with Alcohol of Ammonia.

   Note:
   Do not use cleaning agents containing Chlorinated compounds.

4) **Type Faces:**
   Clean the Type Faces carefully using a dry cloth (see Key Lever Unit Section).

7.TOOL LIST

The Tools listed below are required for servicing:

1) Needle Nose Pliers

2) Phillips Screwdriver:
Large & Small

3) Standard Screwdriver:
Large & small

4) Wrench or Box Driver:
13/64" (5.0 mm)
7/32" (5.5 mm)
15/64" (6.0 mm)
9/32" (7.0 mm)

5) Allen Wrench:
5/32" (4.0 mm)

6) Spring Hook

7) Tweezers

8) Precision Screwdriver

9) Scale

10) Feeler Gauge (Thickness Gauge)

11) Plastic Hammer

8. TROUBLESHOOTING GUIDE

The Troubleshooting Guide explains the causes of possible malfunction of one or several units of a typewriter.
Train yourself to determine the causes of trouble before attempting to correct them. Check for loose, missing or broken Screws, Nuts, Retainers, Studs, Rivets, etc. The moving parts shall be free of binds and properly lubricated. The adjustments shall be always performed following the proper sequence. The relationship of the various assemblies makes it necessary to adjust them in the proper sequence, keeping in mind other possible function/s that the adjustments may affect.

Symptoms	Possible Cause	Solution	Ref.in Manual
BACK SPACE			
Fails to Back Space	• Back Space Arm Spring un-hooked	Hook Spring	5.11
	• Back Space Arm Escapement Base too shallow	Adjust Back Space Arm	4.13
	• Loose E-Ring	Attach E-Ring	5.11
CARRIAGE			
Carriage binding	• Carriage too tight	Adjust Roller and Rail	4.3
	• Spring Drum binds	Free up or replace	3.1,4.4
	• Carriage Rack and Pinion mesh too deep	Carriage adjust-ment	4.3,4.4
	• Escapement Wheel binds	Adjust Escapement Wheel	4.3,4.4
SHIFT UPPER AND LOWER CASE			
Shift binds	• Binds on Torsion Bar	Adjust Center Screw of Torsion Bar	3.18
	• Shift Balance Spring unhooked or binds.	Check Spring	5.8
	• Segment Base binds	Segment adjust-ment	4.11
	• Fails to Lock Shift	Adjust Shift Lock Plate (Step 1)	4.12
		Check Shift Lock Spring (Step 2)	4.12

Symptoms	Possible Cause	Solution	Ref.in Manual
ESCAPEMENT			
Crowding of Letters	• Trip not properly adjusted	Adjust Escapement	4.13
	• Carriage binds	Adjust Roller and Rail	4.3
	• Segment Universal binds	Adjust Segment Universal	4.10,4.11
	• Space Link and Correction too narrow	Adjust Space Link bind	4.8
	• Carriage Rack	Adjust Carriage Rack	4.3
	• Spring Drum binds	Adjust Spring Drum	4.4
Skipping	• Trip not properly adjusted	Adjust Escapement	4.13
	• Defective Escapement Wheel	Replace Escapement Wheel	4.13
LINE LOCK			
Fails to the Lock Margin	• Carriage Movement not smooth	Adjust Roller and Rail	4.3
	• Carriage Stopper binds	Adjust Carriage Stopper	4.6
	• Carriage Stopper fails to lock	Adjust Carriage Stopper	4.6
LINE SPACE			
Fails to space lines	• Defective Line Space Selector	Replace Line Space Selector	4.1
Irregular line spacing	• Platen binds	Adjust Platen	4.1
	• Detent Arm wrong/shape	Adjust Detent Arm	4.1,4.7
	• Worn Platen Gear	Replace Platen Gear	5.4
	• Detent Arm Spring unhooked	Check Spring	5.4
PAPER FEED			
Inaccurate vertical Paper feeding	• Feed Rollers pressure not equal or sufficient	Adjust paper feed or Eraser Table Spring weak	5.4
	• No clearance between front edge of Eraser Table and Platen	Shape front edge of Eraser Table	5.4
	• Paper Bail tension uneven	Parallel Bail	3.5
	• Foreign substance on Platen or Feed Rollers	Clean	6.2
Insufficient Paper release	• Paper release lever maladjusted or defective Paper Release Lever	Replace Paper Release Lever	5.4

Symptoms	Possible Cause	Solution	Ref.in Manual
MARGIN			
Fails to release	• Carriage Stopper Spring off place	Check or hook spring	4.6
	• Carriage Stopper binds	Adjust Carriage Stopper	4.6
TABULATION			
Fails to clear	• Worn Tabulator Chip	Replace Tabulator Chip	5.10
	• Tabulator Chip binds	Adjust Tabulator Chip	4.5
	• Tabulator Rack deformed or (bent).	Reshape or adjust	4.5
	• Set/Clear Mechanism binds	Adjust Set/Clear Mechanism	4.5
Fails to Tabulate	• Fixed Dog is not released	Adjust Tabulator Main Bar or check Tabulator Mechanism	3.10,3.11
TYPE BAR ACTION			
Fails to print	• Type Bar binds	Adjust Link	5.6
	• Type Bar Link or Key Lever Link off place	Hook Link	5.6
	• Segment Universal binds	Check Segment Universal	3.15
	• Typeface-platen gap too big	Adjust Ring and Cylinder	4.13
	• Type Bar Action Mechanism binds	Type Bar Action adjust Mechanism	4.8
Fails to return	• Type Bar and Type Bar Guide too shallow	Check Alignment	5.6
	• Sub-Lever Link off place	Hook Spring	5.6

Symptoms	Possible Cause	Solution	Ref.in Manual
SPACE REPETITION			
Fails to repeat	• Defective Swing Dog Spring	Check or replace Spring	4.4
	• Automatic Space Repetition Key insufficient stroke	Adjust stroke	4.9
	• Spring Drum weak	Adjust Spring Drum	4.4
	• Swing Dog not release from Escapement Wheel	Remove burly or lubricate Escapement Wheel	5.11
RIBBON			
Ribbon damaged or cut off	• Snubbing of Overthrow Stop	Adjust Ribbon Lift	4.16
Ribbon is not fed	• Spools jams on Ribbon Spool Cups	Shape Spool Cups	3.20
	• Defective Ribbon Feeder Ratchet Wheel	Replace Wheel	5.13
	• Ribbon Feeder Pawl or Detent	Check Ribbon Feed	3.20,5.13
	• Disengaged Ribbon Feed Pawl or Detent Pawl Rubbing Ratchet Wheel	Check Ribbon Feed	3.20,5.13
	• Ribbon Reverse Detent out of place	Check Ribbon Feed	3.20,5.13
Ribbon fails to reverse	• No Eyelet in Ribbon	Install Eyelet	4.19
	• Eyelet goes through slot of Ribbon Reverse Arm	Close Slot of Reverse Arm	4.19
	• Ribbon Reverse Trip Binds	Free the Ribbon	4.19
	• Universal Arm misses Ribbon Reverse Arm.	Adjust Ribbon reverse	4.19
	• Ribbon Reversing Detent out of place	Adjust Ribbon reverse	4.19
VARIABLE PLATEN			
Variable line spacer fails to operate	• Spring Pat binds	Removed burly or lubricate Spring Pat	6.1
	• Detent Arm and Platen Gear too shallow	Lubricate Detent Arm or replace if	6.1